NATURE MAGAZINE

FEBRUARY 1930 35¢ VOL. 15, NO. 2

BUY a NATURE BOOK THIS MONTH

Many requests received from the readers of NATURE MAGAZINE asking for the recommendation of books in the various fields of Nature and science indicates an existing demand. This demand is for books that are authentic, practical and worth adding to one's library. It is apparent that it is the duty of the AMERICAN NATURE ASSOCIATION, through these pages, to assist its members by suggesting the worthwhile volumes.

Each month this page will be published in NATURE MAGAZINE. On it will be listed books in two classifications. The first group includes those volumes of current publication regarded by the most competent authorities, consultants of this Association, as outstanding and valuable. The second group includes those books in various fields which are regarded as somewhat standard works and yet are still available from the publishers.

Consider these lists of books, your own particular interests in Nature and your present library, and add an excellent Nature book each month. Send the listed price (which includes postage) of the volume to:

BOOK EDITOR, NATURE MAGAZINE
1214 16th STREET WASHINGTON, D. C.

Nature Books of Recent Publication

IN THE ZOO—W. Reid Blair. Animal observation $2.60

THE UNIVERSE AROUND US—Sir James Jeans. Fascinating astronomy $4.60

MY TROPICAL AIR CASTLE—Dr. Frank M. Chapman. Tropical wild life $5.15

WINGS OF A BIRD—Herbert Ravenal Sass. Essays. $2.60

PERENNIALS OF FLOWERLAND—Alice T. A. Quackenbush. Who's who of perennials $1.60

GARDEN CINDERELLAS—Helen M. Fox. Lily culture. $5.15

ROMANCE OF THE PLANETS—Mary Proctor. The skies. $2.60

BURGESS SEASHORE BOOK FOR CHILDREN—Thornton Burgess. $3.10

GARDENING IN THE LOWER SOUTH—H. Harold Hume. $5.15

MUSHROOMS OF FIELD AND WOOD—Margaret McKenny. Handbook. $2.00

THE BIRD BOOK—Charles P. Shoffner. $2.00

WILD ANIMAL PETS—William and Irene Finley. $3.00

FORESTS AND MANKIND—Pack & Gill. $3.00

Recommended Books for the Nature Library

BIRDS

COLOR KEY TO NORTH AMERICAN BIRDS—Chapman. $3.65

HAND BOOK OF BIRDS OF WESTERN U. S.—Bailey. $6.25

HANDBOOK OF BIRDS OF EASTERN N. A.—Chapman. $4.15

BIRDS OF THE OCEAN—Alexander $3.65

PRACTICAL VALUE OF BIRDS—Henderson $2.60

BIRD GUIDES—Reed. (In two parts, $1.50 each)

MAMMALS

FIELD BOOK OF NORTH AMERICAN MAMMALS—Anthony $5.15

OUR WILD ANIMALS—Moseley $1.85

GARDENING

BOOK OF ANNUALS—Hottes $1.65

BOOK OF PERENNIALS—Hottes $1.65

FOUR SEASONS IN THE GARDEN—Rexford $2.65

ROCK GARDENS—EVERGREENS—SHRUBS—GLADIOLUS—IRISES—DAHLIAS—Rockwell ..... $1.00 each

WILD PLANTS

FIELD BOOK OF AMERICAN WILD FLOWERS—Mathews. $3.65

FIELD BOOK OF COMMON GILLED MUSHROOMS—Thomas $3.65

FIELD BOOK OF AMERICAN TREES AND SHRUBS—Mathews $3.65

BOOK OF WILD FLOWERS FOR YOUNG PEOPLE—Mathews $2.60

WILD FLOWERS AND FERNS IN THEIR HOMES AND OUR GARDENS—Durand $3.65

THE FLOWER FINDER—Walton $3.10

ASTRONOMY

A FIELD BOOK OF THE STARS—Olcott $1.60

THE BOOK OF THE STARS FOR YOUNG PEOPLE—Olcott $2.60

REPTILES AND AMPHIBIANS

REPTILES AND AMPHIBIANS—Barbour $3.65

INSECTS

FIELD BOOK OF INSECTS—Lutz $3.15

GENERAL MANUALS

MANUAL OF THE VERTEBRATE ANIMALS OF THE NORTHEASTERN U. S.—Jordan $4.20

40,000 Families already own this new easy means of HOME EDUCATION

Completely New ENCYCLOPAEDIA BRITANNICA

FOR YOUNG AND OLD ALIKE

Children love to browse through these fascinating volumes. The *new* Britannica assists with school work, brings out unsuspected talents, helps children "find themselves."

THE MAHOGANY BOOKCASE TABLE SHOWN ABOVE IS INCLUDED WITH EACH SET

AN AMAZING SUCCESS. That is the only way to describe the reception of this *new* 14th edition of the Encyclopaedia Britannica.

Fresh from the presses, this newest, greatest Britannica has won immediate and enthusiastic acceptance everywhere. Its popularity has swept the country overnight.

Already it is in 40,000 homes. Already it has given thousands of men, women and children a new enthusiasm for learning, wider interests, new ambition. And now *you* can buy it—have it delivered to you immediately—at an amazingly low price.

"Home Education" includes the entire family

Published at a cost of more than $2,000,000, made new from cover to cover, the *new* Britannica is utterly unlike any other encyclopaedia you have ever known. It is built on an entirely new plan. A book primarily of today—yet of tomorrow, too.

This amazing book actually brings into the family circle a powerful new influence. It brings culture. It brings knowledge, new opportunity. With the *new* Britannica in your home, every new day brings new discovery.

And so the whole family benefits through this new kind of home education. Children, especially, make rapid progress when the *new* Britannica is at hand. It helps them in their school work, answers their myriad questions, teaches them to rely on themselves.

A complete library with 15,000 illustrations

Here is the Britannica you have been waiting for. A modernized, *humanized* Britannica. More interesting—with articles by 3,500 world authorities. More colorful—with 15,000 new illustrations from all corners of the world. More practical than ever—with every word keyed to the needs of this modern age.

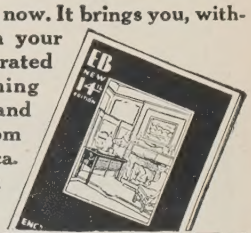
SPECIAL OFFER
New low price—$5 down

Yet the *new* Britannica is not expensive. It costs less than any other completely new Britannica published in the last sixty years. Mass production has brought this invaluable book within the reach of every American family. Now you can own it—at a new low price.

Get the *new* Britannica now—while the present offer lasts. Take advantage of our easy payment plan. A deposit of only $5 brings you without delay a complete set, with the handsome bookcase table included. Before you forget—fill out the coupon below.

FREE illustrated booklet

Clip this coupon now. It brings you, without obligation on your part, our Free illustrated booklet containing maps, color plates and specimen pages from the NEW Britannica. Fill out the coupon and mail today.



SEND FOR FREE BOOKLET TODAY

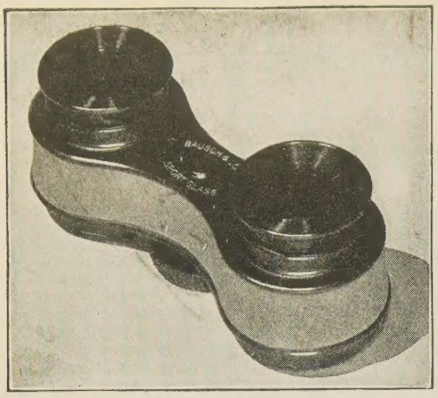
ENCYCLOPAEDIA BRITANNICA, Inc.
342 Madison Ave., New York City Nat.M.3-B1

Please send me by return mail, without any obligation on my part, your 56-page illustrated booklet describing the *new* Britannica together with low price offer, etc.

Name_____

Address_____

City_____ State_____



The Sport Glass

Here are three accessories that

BRING NATURE

STUDY CLOSER TO YOU

THE Bausch & Lomb Sport Glass, shown above, is a remarkable pocket model field glass. It has a wide, brilliant field and surprising magnification. Perfectly balanced, it is held steady easily. Since it focuses very quickly, the Sport Glass is ideal for use in studying birds and game.

Also, it is finished so finely that countless people carry it to the opera or use it in watching races and other sports.

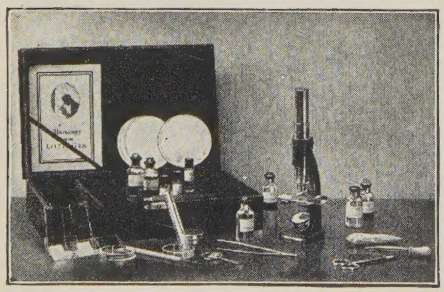
* * *

The Little Gem is, in every sense of the word, a real microscope. Remarkably powerful, it magnifies 5625 areas. In the study of insect or flower life, the Little Gem is invaluable as it reveals clearly formations that, ordinarily, would be lost to the eyes.

* * *

The Little Gem Science Kit consists of the Little Gem microscope and stains, specimen glasses, tweezers, and all the paraphernalia necessary to the amateur biologist. Comes packed in handsome case together with instruction book.

The Sport Glass comes in a variety of handsome finishes at $16.50 to $25.00. Little Gem Science Kit, complete, costs $27.50. Little Gem Microscope, only $17.50. All obtainable at good shops everywhere.

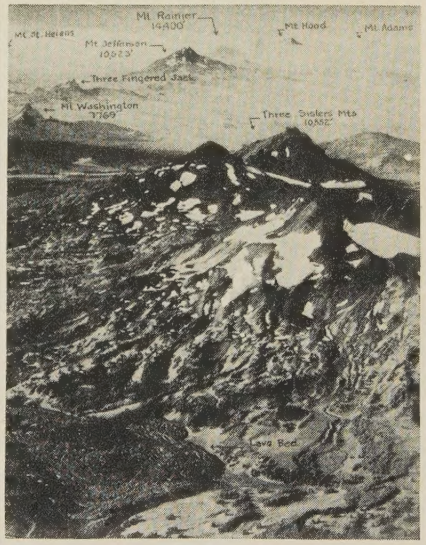


The Little Gem Science Kit

BAUSCH & LOMB OPTICAL CO.

728 St. Paul Street, Rochester, N. Y.

REPORT of high photographic interest was made recently to the scientists of the Eastman Kodak Company, Folmer Graflex Corporation and the Bausch and Lomb Optical Company by Captain A. W. Stevens of the U. S. Army Air Corps following his successful taking of a photograph of Mount Rainier from a point 227 miles distant from the peak. Captain Stevens, who is head of the photographic branch of the Air Corps at Wright Field, Dayton, Ohio, by this feat beat his own long range photography record by fifty miles.



The picture above was made at an altitude of 17,000 feet above a landmark that could be identified on a map. The eye could not see the mountain, but the film of the camera, sensitive to the infra-red light rays which penetrate the haze and smoke could out-see the human eye. When Captain Stevens shot the picture all he could do was to point in the direction of Mount Rainier and wait until the film was developed to see whether he had gotten it. He believes that the trick can be done at even a greater distance with the same equipment. It is also felt that this piece of aerial, long-distance photography achievement is a distinct contribution to military photography. Other valuable data, specifically with respect to the curvature of light rays around the surface of the earth, may also result.

* * *

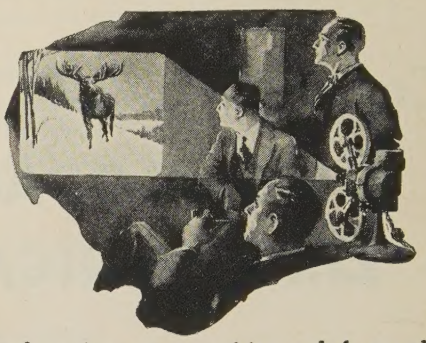
The Eastman Kodak Company announces that it still has a few copies of "An Amateur Photoplay in the Making" available to owners of motion picture cameras. This helpful booklet will be sent on request.

* * *

How many owners of amateur movie cameras are there in your vicinity? Have you an amateur motion picture club? If you haven't organized your film activities you are missing a great deal of fun and satisfaction out of your machine. Get in touch with the Amateur Cinema League, 105 West 40th Street, New York City, and get the dope on the formation of amateur clubs and other helpful data.

Bring the Outdoors Home *with* FILMO

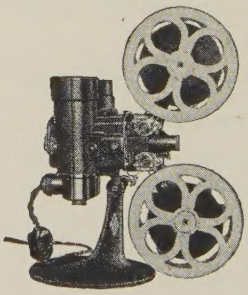
Personal Movie Cameras and Projectors



Bad weather out . . . nothing to do but read about Nature in books! Does this prospect confront you in between seasons?

You might be enjoying a whole evening's pleasure from the many natural history films in the Filmo Library with Filmo Projector. Or you might be reviewing the ever interesting films which you took last fall and summer with your Filmo personal movie camera.

Why not see the nearby Filmo dealer today and learn how much more there is to nature study with Filmo moving pictures? Trouble-free, highly precise, and sturdy, Filmo Cameras and Projectors are made by Bell & Howell, the makers of equipment used by the major film producers for 23 years. Write today for literature.



Filmo 57 Projector
Best by test. Silent movement. Powerful illumination. Fully automatic. $190 and up with case.

All Filmos use 50 or 100 foot film

For black and white pictures, Filmo Cameras use Eastman Safety Film (16mm.) in the yellow box—both regular and panchromatic — obtainable at practically all dealers' handling cameras and supplies. Filmo Cameras and Filmo Projectors are adaptable, under license from Eastman Kodak Company, for use of Kodacolor film for home movies in full color. Cost of film covers developing and return postpaid, within the country where processed, ready to show at home or anywhere with Filmo Projector.

BELL & HOWELL FILMO

"What You See, You Get"

BELL & HOWELL CO. · *Established 1907*
Dept. N, 1813 Larchmont Ave., Chicago, Ill.
New York, Hollywood, London (B. & H. Co., Ltd.)

THE PRICE IS GOING *UP!*

Your Last Chance to Get *Hugo's* FRENCH-AT-SIGHT *at this Remarkably Low Price!*

Dictionary FREE!

This indispensable English-French, French-English dictionary will be given absolutely without charge to everyone who enrolls in the Hugo French-At-Sight course. Published in France, it has been imported especially for Hugo students. The dictionary is bound in rich, dark green seal grain, clearly printed on tough, thin paper. Its 623 pages contain 24,000 words. The supply is limited—clip the coupon and send for course and dictionary today on approval.

THE present edition of this short cut to *usable* French is nearly exhausted. It can not be republished at the present ow price. The royalty contract giving oubleday-Doran the American rights to ublish and sell 10,000 sets of the Hugo ourse soon expires! When the few remaing sets are sold THE PRICE MUST GO P!

Often you have been on the verge of nding for Hugo's *French-At-Sight* on approval! Something has detained you. Now ou *must* act! If you mail the coupon *at ce* you can still obtain the same twenty-ur complete lessons which have taught so any cultured men and women to speak, ad, and write French—at the same low price!

Decide about keeping the course later—your leisure. Only assure yourself this st opportunity to own the course—if you cide that you want to after you have en it.

French *is as Easy as this:*

parlez.....par-lay
(speak)

bouquet.....boo-kay
(a bunch of flowers)

beaucoup.....bow-koo
(much, many)

mais oui.....may we
(but, yes)

The few words appearing above illustrate e simple Hugo key to pronunciation. It is impossible to mispronounce a French word if that key is followed. And every other phase of Hugo's FRENCH-AT-SIGHT is just as clearly and plainly marked, just as easy to master.

Now, you can add a knowledge of French to the list of accomplishments which makes you the individual you are. You can *easily* acquire a command of a vast fund of conversational French, in your spare time at home.

Instead of starting to study French in the schoolroom fashion, with rules of grammar and long lists of irregular verbs, the Hugo method enables you practically to *think* in French, to begin to use actual French sentences with the proper pronunciation and the native accent—*from the very first page of lesson one*. Beginning with complete, useful French sentences, you become more and more proficient—scarcely realizing *how*, it is so easy—until you can converse in French, read French letters and books and write the language as well.

Complete Course Sent on Approval Only $9.85! Pay as You Learn!

At your request—and you need not send a penny with the coupon—we will mail you the complete Hugo course of 24 lessons and the Cestre-Guibillon dictionary for your free examination at your leisure.

Try several lessons; test your progress. At the end of 5 days, if you are entirely satisfied, send us $1.85 as a first payment. If the lessons do not come up to your expectations, return them with the dictionary at our expense. If you keep the lessons, you continue to pay as you learn at $2 each month for 4 successive months—making a total of only $9.85 for the complete course! *Act at once* to be SURE you get your Hugo course at the bargain price. When the present limited supply is exhausted—*the price must be advanced!*

DOUBLEDAY, DORAN & CO., Inc.
American Representative:
HUGO'S LANGUAGE INSTITUTE
Dept. F-592 Garden City, N. Y.

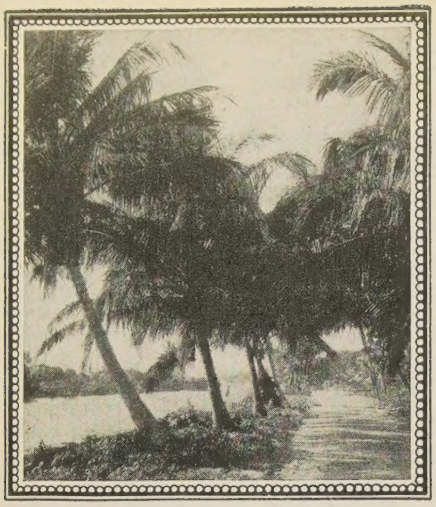
DOUBLEDAY, DORAN & CO., Inc.,
Dept. F-592, Garden City, N. Y.

You may send me the 24 lessons of Hugo's "French-at-Sight" and the imported French-English Dictionary for 5 days' examination. At the end of that time I will either mail you $1.85, and $2 each month for 4 successive months, or return the lessons and the dictionary to you.

Name.....

Address.....

City.....State.....



Ho, for the Haven of Winter Delight!

WEST PALM BEACH! Where happiness runs free and fragrant tropical nights add further joys to those of sunshine days. No minute need be idle, yet every minute can be one of rest. Your own preference controls—in West Palm Beach.

But most of our winter visitors come to play—and such a variety of play they have. Golf on inland courses or at ocean edge; hunting in the deer and turkey thickets; bathing and fishing in lake or ocean, big league baseball, harness and running races; roque, shuffleboard, horseshoes, volley ball, tennis—Nature's own facilities, amplified by a city which wants its winter visitors to enjoy a literal kaleidoscope of play. Aye, play for grown-ups and for the children too.

You can live all winter in West Palm Beach as cheaply as at home. For some necessities you pay less here. And how much more you get—in healthful sunshine, in rollicking recreation, in comfort, in bodily and mental content. Come—live "Where Summer Spends the Winter."

Ask for free booklet and table of certified hotel and apartment rates; fishing booklet too; address V. G. Swinehart, P. O. Drawer B-58.

WEST PALM BEACH
Florida

Nature Has Painted a Tempting Picture in

ORLANDO

EARLY SPRING concentrates in Orlando every charm which Nature has devised for her most favored Florida cities. Municipal pride and good taste of home-owners have further joined interests to make, in truth, "The City Beautiful."

Here, among 1500 close-by lakes and orange groves; on country road or city street, in the parks or recreation grounds, you realize to the utmost the fulness of Florida, in health, sport and relaxation. Bring your golf clubs and fishing outfit; budget ample time for the public games. Orlando holds a stimulating treat for you.

Our pictorial booklet will be gladly mailed on request

ORLANDO CHAMBER OF COMMERCE
700 C. of C. Bldg.

ELSEWHERE in this issue are announced the proposed Nature Magazine trips for the summer of 1930, to several National Parks. To those seeking something different in travel from the ordinary tour, and yet something retaining its best features, together with the best features of travelling alone, the plans of the American Nature Association should be very welcome. Small parties, selected carefully from applicants whose very applications are indications of a community interest, will go out from Chicago, under the care of a personal host whose function is not merely to pay bills and care for baggage, but also to do everything in his power to mould a congenial group; they will be met at the park entrance by a National Park naturalist, himself trained in the art of fellowship and helpfulness; they will go through the most beautiful country in America as far as possible from too pressing contact with civilization, and see its wonders leisurely. The trips are not for mollycoddles who demand a roof every time it rains; who expect, in the open spaces, metropolitan hotel service; they are not for the "crabs", who cannot stand a sore muscle or two, or the harmless jibing that every "dude" in the West gets, or who are not really interested in the parks except to say later they have been there. They are for men and women who wish to enjoy the pleasures of the camp and trail and of the fellowship they inspire; who are interested in seeing so far as possible the wonders of the parks in their natural, untrammelled beauty, and who are "good sports".

Grand Canyon, Glacier, Yellowstone, and Jasper Park, Canada, are the scenes of the 1930 activities, together with the Inner Passage from Seattle to Prince Rupert. Last year, with three trips solely to the South Circle in Glacier National Park, the Association received unanimous acclaim from the 50 members of the parties. With even more wonderful locale this year, it can

Live in ORANGE COUNTY FLORIDA

A beautiful land of groves and gardens, rolling hills and hundreds of lakes. Delightful year-'round climate. All kinds of outdoor sport. Most healthful living conditions. Opportunities in farming or business. For illustrated booklet address, Orange County Chamber of Commerce, 614 State Bank Bldg., Orlando, Florida.

The BELLEVUE-STRATFORD
PHILADELPHIA

Centre of Philadelphia Social Life
Choice of the Particular Traveler

J. M. ROBINSON, *Manager*

AFFILIATED HOTELS

Waldorf-Astoria New York

OVERNIGHT from San Francisco or Los Angeles

A magic castle in majestic Yosemite

The handicraft of twenty-two countries contributes to the rare charm of The Ahwahnee in Yosemite... where you combine fine living with matchless inspirational grandeur.

Ask any travel agent about all-expense tours, including a stop at The Ahwahnee and 2 to 4 days of Yosemite wonder-sights. Booklets from: Yosemite Park and Curry Co., Yosemite National Park, California.

YOSEMITE
& MARIPOSA BIG TREES

"A PLACE IN THE SUN"

One of America's foremost resort hotels.... facing glorious Tampa Bay.... sun bathing and every recreational feature.

CLEMENT E. KENNEDY
Managing Director

VINOY PARK HOTEL
ST. PETERSBURG · · · FLORIDA

OPEN JANUARY TO APRIL
BOOKLET

$3.00 FOR ROOM & BATH

HOTEL PICCADILLY
45TH ST. W. OF BROADWAY
NEW YORK

In the Heart of TIMES SQUARE—

Brand new—
Luxurious—
Exceptional!

EACH room has bath, circulating ice water, electric fan!

Wire at our expense for reservations.

F. D. SOFIELD, Managing Director

WELCOME TO
Hotel MANHATTAN
157 West 47th St., New York

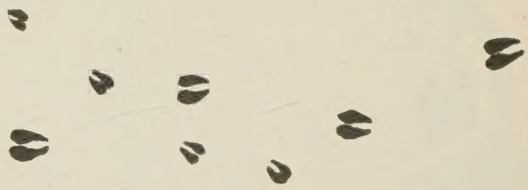
Large room and bath.....$2.50 to $3
Double.....$3.50 to $5

"In the heart of Times Square"
Convenient to stores, theatres and garages.

How Much Do You Know About Woodcraft?

How well do you see? Are your eyes really as strong and accurate as you think? Have you ever tried this interesting Rabbit-Test? It is only one among thousands of valuable helps to the woodsman, hunter and outdoor man—with which these books are crowded.

Scenes like these are the very essence of woodland fascination. This sketch by Ernest Thompson Seton himself shows a baby raccoon being spanked up a tree by his mother. It is one of over 1450 drawings and photographs contained in this set of books covering every phase of outdoor life.



Deer tracks!—another sketch from the LIBRARY OF PIONEERING AND WOODCRAFT, *by Ernest Thompson Seton. Do you know the thrill of coming upon these marks in the wilds? Of recognizing them? Of following them with gun or camera? Let this master woodsman tell you how to read the marks beasts leave behind them, for you to trail.*

All you need to know to make the out-of-doors your home is contained in these six books. Here are definite instructions for finding natural foods. Pictures to help you identify flowers, birds, trees and animal tracks. Games to be played in camp. Pastimes for the campfire circle. Lists of necessary equipment for long or short excursions into wild country. First aid treatment. What to do if you lose your way. A veritable college course in the school of nature!

HOW good a woodsman are YOU? Are you at home in big timber, in the mountains, in a frail canoe on lakes or streams? Can you light a fire without matches? Can you tie all kinds of knots? Can you make a sun-dial—quickly, with materials at hand? Can you lay a good cooking fire? Identify the birds? Tell the difference between edible mushrooms and toadstools? Recognize poison ivy? Erect a tepee?

This marvelous set of books tells you how to do all these things—and countless others. *Hiking and Canoeing* covers every phase of those two sports, from equipment and directions for achieving the utmost comfort on the trail or stream to the handling of small craft over rapids, etc., etc. *Animals and Birds* tells its own story. Tracking, taxidermy, hunting with both gun and camera. *Indiancraft* is full of the lore of the first and best of all woodsmen. Sign language, ceremonials, blazing trails, etc. *Woodcraft,* stories of adventure, instructions for erecting waterproof shelters, living on the land, *seeing* with both eyes everything that is before you. *Earth and Sky,* weather forecasting, romance of the flowers and shrubs and trees. How to find your way by natural signs, "compass-golden-rod," moss on trees, the stars at night. Contains maps of the heavens, etc., etc. *Wild Animals!*

Nature's Own University

No one knows more about outdoor life than Ernest Thompson Seton. No one has studied the lives of Indians and pioneers more carefully. No one has a greater or more sympathetic knowledge of the beauties and wonders of nature—flowers, trees, birds, small winged creatures, wild and domestic animals.

He wrested this knowledge from Nature herself, by living in the open and through years of intimate contact with the American Indians.

Everyone who loves the out-of-doors will find these the most fascinating and valuable of books. Master woodsman and master story teller, Ernest Thompson Seton always has something new and interesting to tell you. Here are over 1700 pages of interesting information and entertainment: Woodland lore, adventure tales, animal stories, Indian songs, dances, ceremonies, pioneer tales and specific instructions covering every phase of life in the open.

Examine These Books—FREE

Without cost or obligation on your part, we will gladly send the six volumes of the Library of Pioneering and Woodcraft, beautifully bound in three-quarter leather and profusely illustrated with more than 1450 photographs and drawings by the author, for 5 days' inspection. Return them at our expense if you choose, or send only $1.50 first payment, then $2 a month till a total of $13.50 has been paid, an astonishingly low price for books of such charm and worth. No risk. A world of pleasure awaits you. Mail the coupon NOW.

NELSON DOUBLEDAY, Inc.
Garden City Dept. S-592 New York

NELSON DOUBLEDAY, INC., Dept. S-592
Garden City, N. Y.

Gentlemen:—Please send me for free examination, the Library of Pioneering and Woodcraft (6 vols.) by Ernest Thompson Seton, illustrated with more than 1450 drawings and photographs by the author, and handsomely bound in three-quarter leather. I shall either return the books within five days or send you only $1.50 as first payment, then $2 a month till the full price of $13.50 has been paid.

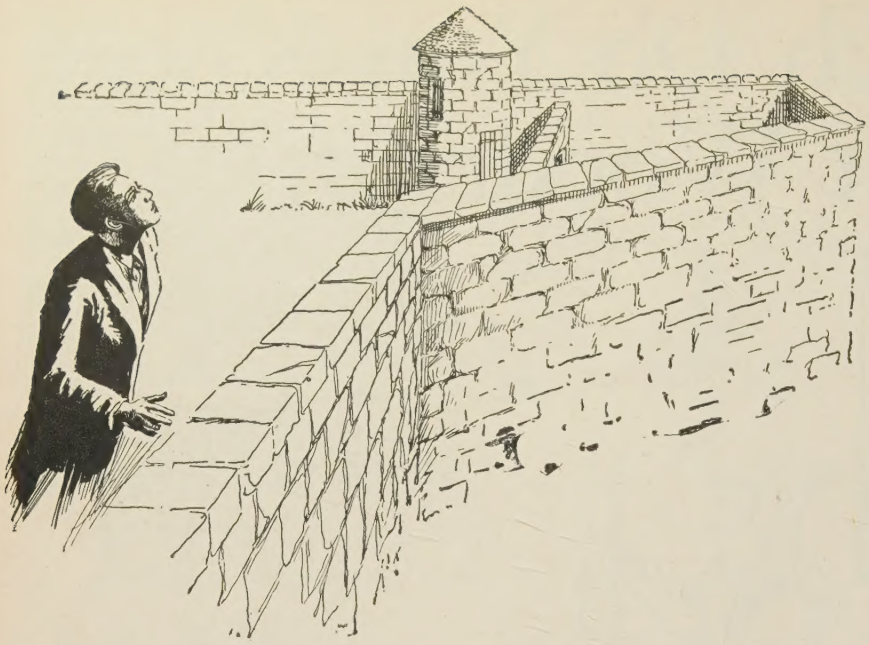
Name.....

Address.....

City..... State.....

Occupation .....

If you prefer the National Blue Cloth edition, send only $1 first payment and $2 monthly until a total of only $11 has been paid.



"I Was Imprisoned —For Life!"

"The knowledge came to me suddenly. Every plan I made to widen the activities of my life, broaden my rightful privileges, and gain success and happiness, was checked by the wall that surrounded me.

"For years I was unaware of this great wall. I thought that I was A FREE BEING and enjoying all the blessings of life. Then came the realization of why I was poor, unsuccessful, limited and unhappy. I FOUND the PATH TO FREEDOM."

FREE BOOK BRINGS FREEDOM

The Rosicrucians have been devoting their lives for many centuries to breaking the bonds that hold man in their power. They have issued a private book that will tell you how you can OVERCOME the OBSTACLES in LIFE, use a new mental power to create a larger, happier career and attract success, health, and prosperity. It means the dawn of a new day—the beginning of perfect freedom. Send for a copy today. It is absolutely free. Write a letter (not a post card) to:

LIBRARIAN D. K.
THE ROSICRUCIAN ORDER
(AMORC)
SAN JOSE CALIFORNIA
(The International Rosicrucian Order)

almost guarantee to return not one dissatisfied or disappointed person.

* * *

The break in the stock-market found its reflection in many cancelled reservations, both rail and ship, but despite the untoward behavior of City Service and United States Steel, more people will undoubtedly travel this year than ever before. One night in November, the Twentieth Century Limited pulled out of New York for Chicago without a single drawing room taken; but that was during the height of the scare. The travel-minded are planning for bigger and better trips while the North presents its version of the Ice Age.

* * *

The Pacific Northwest each winter is finding more favor, and offers its rivalry to famous California. Snow, there, is almost unknown, except in the mountains; golf and other sports can be played all the year around in Portland, Tacoma, Seattle and other cities. Yet the mountains are close at hand for winter sports, and Mt. Rainier Park, open all the year, offers multiple attractions in this line. The Columbia River Highway, the Mt. Hood Loop and other famous trails of the Northwest are nearly as beautiful during the winter months as in the summer, and are much less crowded.

* * *

Death Valley, the hottest place in the United States in summer, is delightful in winter, and California could not be seen without its inclusion. The Union Pacific runs three days' tours to this spectacular desert spot all winter, the cost of which is small for what you get for it. If you are in California, do not fail to get the thrill which comes with the realization that you are standing on a spot actually below sea level.

* * *

Havana, the play-spot of the Western World, has allurements during February that are all the more tempting with each snowstorm. During the latter part of February, the competing boats of the International Star Class Regatta will race in Havana Bay; the Carnival season begins on February 9, and the carnivals with their beauty contests, receptions and parades take place on different Sundays during that month and March. Then there are the horse-races at Oriental Park for those who love the ponies, golf, tennis, swimming, and sight-seeing. The Ward Line is offering an attractive number of all-expense tours to this garden spot, ranging from $165 up for nine to seventeen days. And the three-day ocean voyage will not be the least of the pleasure afforded by such a trip.

* * *

So many adjectives have been used up describing the wonders of Bermuda that anything on the subject is hackneyed. It is the "Gulf Stream Playground". Everyone should go there at least once, to ride over the coral roads, to canoe in the inlets and sounds of lapis-lazuli, to study the great variety of vegetation. The Royal Mail line is offering beautiful, leisurely voyages to Bermuda ranging in price from $70, round trip, up to $800, via the well-equipped "Arcadian". The forty-eight hours spent on this boat are altogether too short, especially when they are bringing you back to the North. Its prices and service are just about the same as those of the Furness-Bermuda line, which for a number of years has served Americans pleasure- and comfort-bent.

CHRISTIAN PSYCHOLOGY

Leads Men and Women to the Kingdom of God and adds unto them the Things and Conditions necessary to their Happiness, as Jesus promised. It teaches them to pray for the things they want in such a way as to get them, as Jesus said they should.

For nineteen hundred years the world has sought a better understanding of the teachings of Jesus, which would enable men and women to have the more abundant life and happiness which He promised.

He said to some of His followers (Mark 11:24): "What things soever ye desire, when ye pray, believe that ye receive them, and ye shall have them." It is a promise that *anyone* may get *anything* he wants, by praying for it—that is, by praying for it in a *certain* way.

Again Jesus said to certain followers who were worrying about their physical and financial affairs (Luke 12:31): "But rather seek ye the kingdom of God; and all these things shall be added unto you." There can be no doubt about what this promise means—especially if we read the context beginning at verse 22. It clearly and simply means that if one can find the kingdom of God, his physical and financial problems will solve themselves—that there will be "added" unto him the things necessary to his happiness.

The tragedy of it is that these promises are not generally fulfilled in the lives and affairs of Christian people. Millions have diligently sought the Kingdom of God for years without finding it—without having anything much added to them. They have prayed earnestly for things and conditions they desired, without getting them. Millions of these good people, in the churches and out of them, are cramped and hampered by poverty, limitations, lack, sickness, worry and disappointment.

But there is nothing wrong with these promises of Jesus. The trouble is that men and women have failed to understand and use them correctly. They have thought the Kingdom of God is a place or condition outside of themselves, whereas Jesus said (Luke 17:21): "The Kingdom of God is within you." They have understood Him to say, in reference to praying for the things they want: "Believe that ye shall receive them," *and that is not what He said,* nor will such belief get what Jesus promised they should.

CHRISTIAN PSYCHOLOGY now comes forward with a great flood of the white light of simple scientific truth. Under the illumination of this light men and women are finding the Kingdom of God and having added unto them the things necessary to their happiness—they are learning how to pray for the things and conditions they want in such a way as to get them, as Jesus promised they should.

CHRISTIAN PSYCHOLOGY is a simple scientific system of Christian life and thought which gives Christianity the power of godliness as well as the form, and puts into it the living, vibrant force which brings prosperity, love, achievement, health, happiness, peace, and more abundant life. It is not a religion, nor a sect, but a movement within the churches, loyal to their work and ministry, and based squarely upon the teachings of Jesus as verified, explained, simplified, and practically applied by modern scientific Psychology.

CHRISTIAN PSYCHOLOGY is given to the world by Judge Daniel A. Simmons, whose gifts to the world are already so rich and full. He is widely known as a psychologist, author, teacher, and lecturer. He is now, and for more than fifteen years has been, one of the judges of the highest trial court in his state. He is the founder of The American Institute of Psychology, with its thousands of students all over the world, and highly prizes the great mass of marvelously happy achievements that these students have reported as results of his teachings.

CHRISTIAN PSYCHOLOGY is Judge Simmons' crowning work—a work in which the Christ-light shines forth as the true light of the world, leading men and women on to higher, nobler, happier and more abundant life. He has set forth its fundamental principles in a marvelous soul-thrilling lecture of 6,000 words entitled "The Kingdom of God," in which he tells just what the Kingdom of God is, where it is, and how to set out to find it and enjoy its rich rewards. A manuscript copy of "The Kingdom of God" will be

Sent Free and Complete

to anyone who will fill out and return to us the coupon printed below. The sending of this remarkable lecture is a work of loving personal service, rendered in the name and spirit of Him who said, "Freely ye have received, freely give." Fill out and mail the coupon *now.* Let nothing crowd it from your mind.

THE AMERICAN INSTITUTE OF PSYCHOLOGY
2702 Law Exchange Bldg. Jacksonville, Fla.

The American Institute of Psychology
2702 Law Exchange Bldg., Jacksonville, Fla.

Please send me entirely free and without any obligation, complete copy of Judge Simmons' soul-thrilling 6,000 word lecture, "The Kingdom of God," explaining the fundamental principles of Christian Psychology, the new knowledge that leads to a happier, more abundant life.

Name.....

Street.....

City..... State.....

NATURE MAGAZINE

PUBLISHED BY

THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

THE MAGAZINE

Editors

PERCIVAL S. RIDSDALE
Managing Editor

ARTHUR NEWTON PACK
Associate Editor

RICHARD W. WESTWOOD
Chief, Editorial Staff

R. BRUCE HORSFALL
Artist

EDWARD A. PREBLE
Consulting Naturalist

HARRY E. RADCLIFFE
Business Manager

PAUL F. HANNAH
Assistant Editor

GARNET W. JEX
Assistant Artist

TABLE OF CONTENTS

February, 1930

$3.00 a Year — 35c a copy

THE ROAD RUNNER	*R. Bruce Horsfall*	Cover
THE SENTIMENTALIST		73
TRAILING THE MOUNTAIN LION	*Arthur Newton Pack*	75
SOME MORE BARNYARD PETS		82
THE CABBAGE BUTTERFLY	*C. F. Greeves-Carpenter*	84
A MODEL HOME	*Caroline Stafford*	86
SKIPPER, THE MURRE	*Ben Hur Lampman*	87
A CROW TRAGEDY	*E. I. Mason*	88
THE OCEAN RIVER AT OUR DOORS	*Charles Fitzhugh Talman*	89
A TRINITY OF LOVELINESS	*Albert A. Hansen*	93
ON WESTERN TRAILS		97
OUR VANISHING CACTI	*Marian MacLean Finney*	99
ORPHANED ACRES AND UNCLE SAM	*Paul F. Hannah*	101
THE LIFE OF NAILIE	*Muriel A. Jaisohn*	105
THE NATION'S BEST PHOTOGRAPHS		106
TILLING WATERED ACRES	*Lewis Radcliffe*	107
HOW THE CELESTIAL SCENERY SHIFTS	*Isabel M. Lewis*	111
SNAKE BIRDS	*W. L. McAtee*	113
SACRED LILY OF INDIA	*Pearl K. Leonard*	114
INDEX TO ADVERTISERS		132

THE ASSOCIATION

Officers

ARTHUR NEWTON PACK
Princeton, N. J., *President*

CHARLES LATHROP PACK
Lakewood, N. J., *Chairman Board of Directors*

PERCIVAL S. RIDSDALE
Washington, D. C., *Secy-Treas.*

RICHARD W. WESTWOOD
Washington, D. C., *Asst. Secy.*

HARRY E. RADCLIFFE
Washington, D. C., *Bus. Mgr.*

WILLIAM L. FINLEY
Jennings Lodge, Ore.
Director, Wild Life Conservation

DR. E. LAURENCE PALMER
Cornell University, New York
Director, Nature Education

RUSSELL T. EDWARDS
Washington, D. C.
Director, Educational Publicity

Scientific Consulting Board

DR. L. O. HOWARD
Senior Entomologist, U. S. Bur. of Entomology

DR. HARRY C. OBERHOLSER
Biologist, U. S. Biological Survey

HENRY O'MALLEY
U. S. Commissioner of Fisheries

C. W. GILMORE
Curator of Vertebrate Paleontology
U. S. National Museum

DR. WALDO L. SCHMITT
Curator of Marine Invertebrates
U. S. National Museum

VERNON BAILEY
Chief Field Naturalist
U. S. Biological Survey

DR. PAUL BARTSCH
Curator of Mollusks
U. S. National Museum

DR. EDGAR T. WHERRY
Wild Flower Preservation Society

DR. T. GILBERT PEARSON
Nat. Assoc. Audubon Societies

DR. WILLIAM M. MANN
Director, Nat. Zoological Park

Nature Magazine, past and present, is indexed in the Reader's Guide in your library.

NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter May 31, 1927, at the post office at Washington, D.C.
Additional entry at Greenwich, Conn.

Subscribing Membership Blank will be found in the back pages of the magazine.

Publication and Editorial Office, 1214 16th Street, N. W., Washington, D. C. Additional Offices of Publication, Greenwich, Conn.

ADVERTISING OFFICES

New York—171 Madison Ave.
Chicago—Mather Tower Bldg.
Washington, D. C.—1214 16th St.
San Francisco—Hunter-Dulin Bldg.
Los Angeles—Lincoln Bldg.
Seattle—Henry Bldg.
Atlanta—Grant Bldg.

Copyright, 1930, by American Nature Association
Title Registered U. S. Patent Office

The SENTIMENTALIST

An Editorial

One frequently sees the Nature lover or "sentimentalist" scored for his lack of grasp of a situation that is often tersely described as "Game versus Vermin", or some other aspect of conservation. Since the opinions expressed often show a lack of appreciation of the standpoint of the non-hunting lover of wild life that is quite as profound as the ignorance that is ascribed to him, his viewpoint may be emphasized.

The "sentimentalist", as he is termed, often in derision, may have as broad a background of experience as his critic. Sometimes he is a sportsman who has seen, with the passing of the years, the gradual depletion of our wild life, and who has laid aside the gun. He may be one who has never hunted, but derives ample enjoyment from observation of wild life, without killing. Sometimes he has other points of view. In any case his attitude should, in fairness, be accorded that degree of respect that accompanies sincerity of purpose not actuated by hope of gain.

Especially during the past thirty years have we seen the wild life of our continent ravaged in the name of sport, and the commercialism that depends on it. In this destructive alliance there has grown up a theory that the rights of the sportsman are paramount, and that he is justified in destroying any species that interferes with one that has been designated as game. This attitude seems to betoken a degree of selfishness, and an assumption of ownership, that will not stand the test. Has he who has never taken up the gun abandoned title to his share of grouse, or quail, or hawk, or owl? Is not his enjoyment as worthy of recognition as that of the man who finds enjoyment in killing? By what process of reasoning is the non-killer asked to relinquish his share? Surely he has a right to claim joint interest in wild creatures, and to assume some responsibility for their protection.

Settlement has seriously interfered with many of our larger species; no one believes that the bison could maintain its millions on our western plains. But settlement, and natural enemies, and diseases, have all been much overworked in accounting for the recent rapid decline in our game species. The disinterested student, reviewing the history of our game during the past few decades—an ever-dwindling supply pursued by a constantly increasing army of hunters—believes, unless a truer type of conservation is adopted, that the virtual disappearance of those marvelous creations that in his own memory peopled abundantly the woods and fields and marshes of our continent is inevitable. If in his pleas for less killing he may seem to tread on the toes of sport, it is through fear that the few larger species that are yet spared us in fair numbers will follow those that have gone.

An assertion given much emphasis is that the non-killer does little or nothing to preserve our wild creatures. What greater protection can be given the bird than to spare its life? And, as examples, let us remember the gift of Marsh Island, Louisiana, by Mrs. Russell Sage; the Rainey Wild Life Sanctuary, in the same state, financed by Mrs. Grace Rainey Rogers; the earlier successful work of Abbott H. Thayer in behalf of the seabird colonies on our Atlantic Coast, and the recent act of Edward Bok in establishing his Florida preserves. What of the thousands of dollars contributed by the Audubon Societies and other disinterested organizations, and expended in sanctuaries, warden service, and winter feeding? Especially let us not forget that greater value, unmeasurable in terms of money, represented by the moral and educational influence of such efforts.

The school of thought that the Nature lover represents and that brings him criticism is largely the direct product of conditions that are continually becoming more evident. His forces are being recruited from the ranks of those whose repugnance to the slaughter that so often masquerades as sport has forced them to action, by landowners and farmers who resent the destruction of property caused by careless hunters, and who are determined to protect the wild creatures they raise, and by sportsmen who have come to realize that the benefits gained by life in the outdoors may be obtained without killing, and who are welcoming the new régime.

The "sentimentalist", contrary to the conception pictured by his critics, is by no means an isolated and visionary backnumber, ignorant of his subject and spending his time deploring and supplicating. He is a student of the present, interpreting it by the lessons of the past, and working for a more abundant future. The fact that he is being recognized as a militant force is significant

COUGAR, OR MOUNTAIN LION—ANOTHER VANISHING AMERICAN

For their sins, both real and imagined, these native cats are being gradually wiped out. Only about five thousand remain

NATURE MAGAZINE

Volume 15
Number 2

February
1930

WRITE YOUR OWN CAPTIONS

What is the cougar thinking about here while it regards Bill Finley in the nearby tree holding something that whirrs in a black box?

TRAILING *the* MOUNTAIN LION

And, What's More, Making Him Pose for Pictures

by Arthur Newton Pack

Photographs by William L. Finley and the Author

"JUST as I came out under that tree and fired at the lion, he screamed and jumped straight at me. I shot him seven times while he was in the air, and if I hadn't had that Luger automatic he'd sure have broken my neck. Another time . . ." and just then an owl hooted. The listeners shivered, but the old owl was undoubtedly wise enough to know the kind of "lyin' hunting" that is done around the rim of a cosy camp fire.

Eastern tourists constitute a serious temptation to the veracity of a "dude wrangler guide". The only lions that such an audience knows about are the kind which a well-known hunter and wild animal photographer baits with a zebra tied to the rear axle of his automobile in brightest Africa, or the supposedly bloodthirsty beasts which pursue helpless heroines and capering comedians throughout six reels of film (with roars now thrown in free). And yet there really are wild lions in America. There are mountain lions, cougars, pumas, panthers, painters, catamounts, brown tigers, varmints, Indian devils, mountain screamers, king-cats, or whatever the story teller chooses to call them. Some of the lion stories are true, but the live material to make stories about is

ONCE more a Nature Magazine photographic expedition gets what it goes after. In this article Mr. Pack tells some of the experiences of the recent trip to get pictures of mountain lion—a vanishing species—in their native habitat

rapidly disappearing. Where elevated trains shriek and Lions Clubs now meet on the seventeenth floor, real mountain lions once roved. Then all good citizens preached that the only good lion is a dead one. Indeed they not only preached but practised so effectively that there are no longer mountain lions anywhere in the eastern United States. Today western ranchmen carry on.

Southwest of Safford, Arizona, lies a fine collection of materials left over in the making of the rest of the world, but assembled in a somewhat careless manner. These are the Galiuro Mountains. Perhaps it is this very irregularity and haphazard quality in the scenery of the wilderness that gives it its wonderful charm, but that also has had its effect upon Arizona mules and some few Arizona citizens. We had been commended to a gentleman resident of this country who owned mules and horses. He agreed to transport us into the back country of Rattlesnake Canyon to pursue mountain lions in their natural habitat and take motion pictures of both. We also had Cleve Miller, an experienced lion hunter on Uncle Sam's payroll and four bloodhounds trained to follow no trail but that of a mountain lion. Mere man with all his cleverness can not find a lion when he wants one. Everything looked very bright, and nothing had been overlooked except the vagaries of Arizona mules.

But all was not as rosy as it looked. There followed days of riding the rim rocks; battling our way through the terrible scrub growth of the steep and treacherous hillsides; following trails that ranged from lukewarm to frigid. All to no avail. At last one day when our food supplies were running low Miller declared, "There's more lions in my country than there ever was or will be in this God-forsaken range. A man can ride after his

WHAT ARE THESE MEN FOOLING FOR?
The lion dogs can't understand these antics, least of all not killing the lion they have tracked

A FILM STUDIO IN THE TREE TOPS
Few feet separated Bill Finley, in his tree from the cougar in its—but that's how it is done

dogs without getting into some blind box canyon he can't get out of. There's wild turkeys, too—lots of 'em, and good water. If I had you folks in there I'd sure show a lion where you could get at him."

And so we left the Galiuros, Miller to ride home and meet us at "the old MJ Bar trap on Stray Horse Creek," and we to make a long, round-about trip to Miller's Utopia of game not far north of Safford. Our route took us by horse and automobile around through New Mexico and back into Arizona, over roads almost unbelievable, until we came to the Blue River and at last a low, log building bearing a shabby sign, "Blue P. O." There we left the car, found that we could outfit up the canyon a bit, and at last rode west from the Blue River. In a few hours we came out at a roughly-fenced corral in some woods by the side of the stream we had been following. This stream was the Stray Horse and the corral was the MJ Bar "cattle trap" where Miller was to meet us.

In Arizona a man does not say, "I'll meet you at the cigar counter at ten minutes after three." He says, "I'll get to the MJ Bar trap about Monday and meet up with you there," and whoever arrives first waits. Twenty-four hours after our arrival Miller rode into camp, leading an extra horse to carry his bed. Old Sandy, Blue, Boob and Rosy were with him,—not on any leash, but fastened together in pairs to discourage hunting en route.

Next morning as we were eagerly preparing to start again on a lion hunt, two strange horsemen appeared. Western hospitality dictated that they be asked to "get down and have a cup of coffee." Hodges and Cosper, who had outfitted us, knew the men by name, for everyone in this country naturally knows all of his neighbors within fifty or a hundred miles. They were camped up a side canyon not far away from us and had ridden into the mountains to see how their cattle had fared over the winter and to brand such calves as they could find. Hardly had the appropriate explanations been given when the dogs set up a furious barking and yowling, and

three strange hounds appeared, followed by another horseman. It seemed as if this great wilderness had suddenly become heavily populated. I saw Cosper and Hodges exchange a quick glance, and Miller's face assumed a peculiarly tense expression.

"Hello, Ben," said Cosper. "Get down and have some coffee."

As the new stranger strolled over to the fire and squatted on his heels, the name Ben suddenly clicked in my mind. Ben Black, a rival lion hunter, was also working for the government, and Miller had spoken more than once of Black's encroachments on what our hunter considered his exclusive territory. There was no chance of these two enemies working together, and if the old adage about too many cooks spoiling the broth was true, certainly too many lion hunters would spoil our chances of getting mountain lion pictures.

Conversation in our little circle was polite, but strained. "You hunting lions?" inquired Black.

"Yes," replied Miller. "These folks want me to tree a lion for 'em so they can get some moving pictures." Silence.

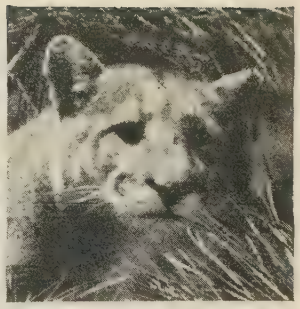
After a time Hodges threw his cigarette into the fire. "Where are you figuring on hunting, Ben?"

Black caught the idea. No other words were necessary. "I saw a track over at the head of Neckup last night on my way over, and I kind of figured on following it up with the dogs."

Cosper now joined in. "We are hunting on this side of the Stray Horse today, so I guess we're not likely to meet."

"No, I guess not," replied Black. "That lion track I saw was headed the other way."

For several days the agreement held. We rode each morning with Miller up and down the mountains through a new kind of brush which tore at our hands and faces and whipped our chaps into a worn and weary appearance. Several times the dogs took the trail of a lion without success.



Each day we rode back to camp early in the afternoon, for the sun was then too hot, and what little scent might have been left in the morning would be gone. It was good to get back to our bubbling creek, fed by the snows which still lingered far back at the nine-thousand- and ten-thousand-foot levels. It was good to feel one's legs and arms and find them all there, and to say, "Well, my horse didn't fall today, although when we pitched off that rim rock after the dogs I don't see how he ever kept on his feet." But the "hunting" and lying we did about the camp fire lost its charm; everyone had told all the lies he ever knew. Time was running against us, and we had no lion.

Now came news which, like the fancy or mirage of a cooling spring to the thirsty desert traveler, brought longing and dismay. Hugh Trainor, one of the cowpunchers, rode into camp one evening. "Ben Black got a big lion yesterday," said Hugh. "He was starting for home and I rode along with him for a ways. He struck a trail about half-way to the rim road and killed the lion over on Strawberry Mountain. Too bad you folks weren't there, for the lion was a big fellow and he treed low where he'd have made a good picture."

We sat about the fire and cussed. Cleve Miller was in the dumps. He prided himself on being the best lion hunter in Arizona and, through Ben Black, fate had handed him a blow. He could not even tell more stories of his past prowess. DeWitt Cosper alone seemed hopeful, and long after we sought our own bed rolls under the two fir trees he and Frank Hodges were still talking

TO JUMP OR NOT TO JUMP, WHICH SHALL IT BE?
Above the mountain lion surveys the situation below, while, anxious and expectant, one of the dogs is tense waiting for what may happen next

(Left) WE COULD NOT RESIST PRINTING THIS PICTURE—GUESS WHO

Correct, it is Bill Finley mounted for a stirring gallop over the country-side on his spirited thoroughbred

(Right) ARMORED FOR THE ROUGH COUNTRY WHERE LIVES THE MOUNTAIN LION

Arthur Newton Pack, president of our Association and leader of the expedition, getting ready for the day's ramble

in low tones about the fire. The next morning we awoke to a dead camp. The men had already gone.

Over our breakfast of beans, biscuits, and beef—the three B's of Arizona—we discussed the situation. We knew that if they did find a lion and tree him someone would come back to guide us to the spot. We were tired of that strenuous riding, anyhow. Long ago we had been forced to give up the scheme of using a packmule to carry the motion picture outfit. The mule always got caught in the brush and tried to wipe the cameras off against a tree. Bill Finley is a professional wild animal photographer, and both of us used standard size cameras. We had two hand cameras, however, and these we carried fastened to our saddle horns. In spite of our leather chaps, our knees were black and blue from the banging of the boxes against them. The camera cases were nearly cut to pieces. Mrs. Pack carried our tripod on the horn of her saddle, and she, too, had been nearly wiped off her horse several times, when the case caught in the brush and swung against her.

Suddenly, about two-thirty, we heard the clattering of hoofs, and the three men came splashing up the stream.

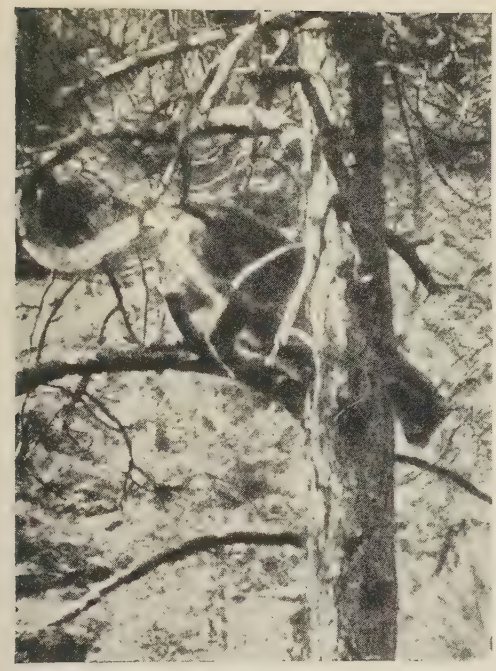
"Well, I got a lion for you sure thing this time!" yelled the hunter. "The dogs have got him up a tree clear on the top of Red Mountain!" He swung his leg over the saddle horn and began the narrative.

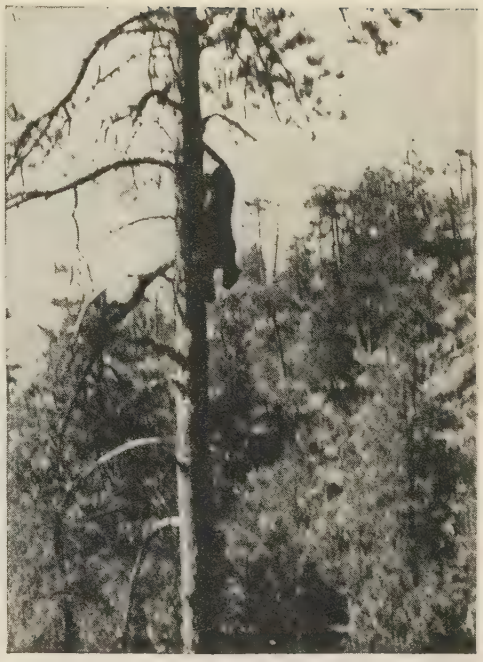
"Our horses are nearly dead. It sure has been one heart-breakin' ride. That north side of Red Mountain is just one series of rim rock, and cliffs, and it is pretty near impossible for a horse to get up. Those dogs hit a lion trail about daylight, but they lost it later. When DeWitt come up, he suggested that he 'cut sign' on ahead a way, farther up the mountain, where the ground wasn't quite so dry. Well he found another lion track and when I brought the dogs up, they sure recognized it as the track of the same lion. They kept on up the side of the mountain, lost the trail at another open sunny place, and again we found it for 'em. This time they went clean up to the very top of Red Mountain. My horse fell twice. It was the worst going I ever saw. Then, just over the top of that mountain, those dogs come upon the lion. He must a'been asleep or resting. First thing I knew I seen old Sandy jump the son of a gun out of some brush. He's a big fellow all right, and he was so surprised to find the dogs right on him that he ran only about a hundred yards or so and scrambled up a pine tree. But believe me it sure is some ride from here."

When we looked at their horses, we believed it. Miller and Cosper both thought that we might more easily get up to where the lion was by starting up Stray Horse Creek and going west until we hit a side ridge which ran toward the peak of Red Mountain. We held a council of war as to what to do. If it should take three hours to get up to the lion, very little daylight would remain for pictures, but we had waited three weeks to get a chance for pictures and simply couldn't afford to miss this one. The only alternative was to spend the night under the tree. The mountain was nearly nine thousand feet high, and it would be bitter cold. The country was so rough that no bedding could go with us. Blankets or no blankets, food or no food, up Stray Horse Creek we started.

It was a long, tough ride before we at last stumbled down to the tree, where, forty feet above us on a sturdy limb, crouched the lion. He was a big fellow, sure enough, about the size and color of a circus lion, but without the mane. The cougar's face, too, was different,—more like that of a cat. The long tail, without noticeable tuft, hung down and twitched slowly from side to side as the creature eyed us and snarled at the barking dogs.

The older dogs, Sandy and Blue, could not understand why their quarry should





TWO VIEWS OF OUR FRIEND AND MOVIE STAR ON LOCATION

At the left a survey of the situation below is under way and at the right a decision has been reached to come down and change trees

be kept so long in the tree. They leaped upon their master; begged and besought him to kill the lion and be done with it. Old Sandy even refused to drink. He simply sat at the base of the tree and looked up.

About the base of the tree we built a crackling fire, and collected great piles of wood to keep it going. Then Miller and Cosper set out for camp, hoping to get in before dark. In the morning they would return with food and water. Frank Hodges clearly did not like the idea of the strange vigil, but he stayed on. Darkness slowly came. The canyons below us were already dissolving into gloom, and the last rays of light gilded the mountain top above us. A cold breeze stole in from the main range of the White Mountains to the west. We hugged the blaze. As the flames leaped up, our lion climbed a little higher in the tree. He did not seem to be excited about it, but settled himself on a limb. The dogs gradually realized that we were looking after the lion and finally condescended to lie down and doze.

It is all very well to talk about sleeping about a camp fire without blankets, but in the high mountains in April the word sleep is—well, just try it! We sat and shifted positions and tried to keep up our spirits. Even the thought that up there in the darkness forty feet above our heads lay a large mountain lion was secondary to warmth. Once or twice Finley snored, and surely we all dozed, to awake and shiver. Somewhere not far away a great horned owl hooted.

At last, over behind the opposite ridge, the stars began to grow dim. Morning was coming, but in the mountains this is the coldest time of all. We threw more wood on the fire and hugged it closer still. At last sunrise came. Now able to see my way, I climbed a little way up the steep slope from the tree, reveling in the warmth of surplus effort. I turned to look at the tree top. "He's still there!" I shouted. Mrs. Pack came scrambling up to see for herself. The great cat lay sprawled out on the limb, with one forepaw doubled beneath him and one forefoot and one hind foot hanging down. He raised his head and looked at us in a rather bored manner, as much as to say, "Those darned human beings are still there. Won't they ever go away?" At my shout, however, two of the younger dogs began to bark. The lion turned his head to look at them, and snarled, whereupon the other dogs joined in the chorus.

It was after eight when the other men appeared with water, and we made ourselves hot coffee and ate a little dry bread and jam. We had hardly finished when there was a great shouting, yipping, and barking above us, and down the ridge rode Hugh Trainor, his partner, and the rival hunter, Ben Black, with his dogs. They had heard that Miller had a lion treed, and in true Arizona style had followed the tracks of the horses to the spot.

It was necessary to get the lion to change his position for pictures so a shower of small stones was tried. The lion snarled, and although the missiles could not hurt him at that height, he decided that it was no place for a self-respecting animal and proceeded forthwith to come down. He came down head first, spiraling about the tree for the best foothold. My camera was mounted on a tripod on the steep slope, where I could get a good picture of his actions. Finley was well placed at an opening in the brush. This combination worked excellently, for the lion came out on the bare trunk, about twenty-five feet from the ground. Suddenly, and without any warning, he leaped clear in one magnificent jump. His long body, with tail straight out, described an arc right in front of Finley's camera, and he hit the ground close to one of the dogs, a good thirty or forty feet away from the base of the tree.

At the first movement of the lion the dogs had set up a howling and barking, and as the tawny body launched itself through space we all began to shout with

excitement. The lion landed with a thud, but safely and catlike on all four feet. Before the dogs could recover from surprise he was off through the thick oak brush. I tried to follow his progress with my camera, but the brush was too thick. Swinging the lens around in advance of the lion's probable path, I sighted the great cat making up another tree. I pushed the lever. Not one of the dogs reached him, and he scrambled up catlike, but with a spiral motion about the trunk, until he was once more among the limbs and could climb with their aid. Up to the very top of the tree. We all hurried with our cameras, as rapidly as we could over the rough ground. All seven dogs were barking furiously and jumping about the trunk of this tree, another pine about fifty feet high.

A ROUGH COUNTRY—THIS COUGAR LAND

The members of the expedition hit the trail with the guides on the movie mountain lion hunt

About twenty feet away was virtually a twin tree. Marvelous luck! Bill Finley called to one of the cowboys to throw his rope over a limb. With this aid he began to climb; reached the first good limb and hauled up the camera.

Our guides and the cowboys looked aghast. They could not climb, and, truth to tell, they were more or less afraid of the lion. Finley worked his way up, hauling the camera after him. As Bill climbed so did the lion. At last both the great cat and Finley were seated opposite each other on the last strong branches. There were nineteen feet between them. Finley pointed his camera at the lion. The lion laid back his ears and snarled.

Bill was in his element and perfectly happy. "What shall I do if he jumps on me?" He called down.

"Throw the camera at him."

"Do some heavy jumping yourself."

"Change places with him."

The lion kept on snarling. The camera began to buzz. I worked around the mountain side with my camera, trying to get a place where I could get them both in the picture. Finley used his film load; then came part way down the tree, lowering his camera by the rope to exchange for a full one.

This time Bill had a six-inch lens for a full-sized close-up. The lion turned his back and acted quite bored. Finley had to heave bunches of pine needles and cones at the lion to stir him up. Once the big fellow came out on the limb as far as he could toward Bill. Below we held our breaths. I had at last found a fairly good set-up and stood poised with my hand on the release lever, determined, that, inasmuch as I could not help Finley, I was going to get a splendid picture of his rapid demise. But the lion had not much bluff in him, and no fight at all. Such is the way with our American mountain lion. He can do a lot of damage if he wants to, but he makes it his business to avoid a fight unless absolutely necessary. The lion lay down again and licked his chops.

Finley climbed to the very top of the tree and leaned out as far as possible. He pointed his camera and pushed the lever. Nothing happened. The film was jammed. Climbing part way down he called for a changing bag, and, balanced in a fork of the tree, both hands in the light-proof bag, fixed the jam.

The men were getting restless. It was noon, and we were hungry and thirsty. Finley called down that he wanted to get the lion yawning. No luck, and finally he came down to suggest we get the lion to move again. With both cameras set up at points of vantage, we again hurled rocks at the lion. He merely snarled, but apparently he had made up his mind that there was no use in coming down. Miller said that it was unusual for a lion to jump out of a tree more than once or twice.

IN CAMP AFTER A THREE-COURSE MEAL

Beans, bacon and bread below the belt, then comes the business of washing the dishes

Now, we knew that that lion had

caught a deer, to which he was certainly entitled. We had no evidence that he had killed any calves recently, and besides, he had performed splendidly for the movies. Mrs. Pack suggested that we return to camp with the dogs and allow the lion to escape. Finley and I were strongly of the same mind. Cleve Miller, however, had been loaned to us by the U. S. Department of Agriculture as their crack lion hunter, and the idea of deliberately permitting a lion to escape appealed to him as so unique that he was willing to do so. He only asked that we pay him the money he could not then honestly claim from Uncle Sam. But there were two cowboys present who owned cattle in that part of the country, and a rival lion hunter whose record would be improved by this lion. Even if we departed, it was more than likely that Ben Black would stay around, kill that lion sooner or later, and win the credit for it. Miller was distinctly worried, and there was a tension in the atmosphere. I looked at Finley and he nodded. "All right, shoot him," I said. It was an easy shot for Miller.

By the time we had gathered and packed our cameras Miller had the lion about skinned. "Hey!" he shouted. "Don't you want to take some of this mountain lion meat back to camp. It's good eating." I had heard before that mountain lion meat tasted like lean pork, but had never tried it. So I gathered up the steak Miller had cut off before feeding the dogs. With it in one hand and my camera in the other, I started up the mountain.

I was sorry our lion was dead, for he made upon the motion picture film a record which may before long become part of the history of a species practically extinct. I could not deny that this largest American cat is destructive. That he feeds equally upon deer and cattle, where cattle are available, is well known. He will destroy horses, burros, and even goats. Ernest Seton estimates that there may be as many as 5,000 cougars all together remaining in the United States. If each cougar kills $1,000 worth of other animals each year (counting deer which are protected for the benefit of the sportsman and often at the expense of the farmer whose crops the deer may eat) then the annual bill of damage chargeable against the cougar's account is $5,000,000. However, I recalled that it has been reliably estimated that domestic cats in New York State alone destroy 3,500,000 birds annually. The same United States Biological Survey which hires men to exterminate mountain lions estimates the value to the farmer of insect and weed-seed eating birds at $1.00 each per year. Apparently, therefore, taking the entire country instead of just New York State, domestic cats are responsible for a loss many times greater than that attributed to the cougars. A few cranks might like to exterminate domestic cats also.

The cougar, because of his taste for deer, is relentlessly pursued by hired professionals, even in most of our western National Parks where game is supposed to roam unmolested. In the Kaibab Forest of northern Arizona the nation has had one example of what overprotection of deer may bring about. When deer multiply without check, the question of food supply becomes serious for them. They gnaw the bark of trees and eat young seedlings, with consequent damage to the forest. Even then many slowly starve to death. Is it not better to permit the natural enemies of deer to take their toll and keep the herds within bounds?

If one grants that deer should be protected so that sportsmen can have the pleasure of shooting them, then why not apply the same rule to the mountain lion? A few of the big-game hunters who go to Africa after lions there might be encouraged to concentrate a little effort on the American lion. President Roosevelt hunted American mountain lions as well as African lions, and wrote most interestingly concerning his adventures, but since that time comparatively few sportsmen have tried it. The shooting of a cougar in a tree is, of course, ridiculously easy and anything but a sporting proposition. The difficulty and danger (for of such stuff is real sportsmanship supposed to be made) lies in the pursuit, the rough riding, and in the wildness and beauty of those mountain fastnesses where a few of these creatures dwell.

The United States Government does not consider mountain lions as game, but merely as creatures so contemptible that professional hunters are hired at five dollars a day and sent out to do away with them. The government uses tax money for this purpose; but the government, through the same Department of Agriculture, does not actually send men to kill the beetles on my fruit trees. It only tells me how I may kill them. As I climbed the mountain with that piece of lion meat in my hand, I wondered whether the American people are giving a square deal to their only native lion.

The National Flower Poll

With a total of more than a million votes cast in NATURE MAGAZINE'S *National Flower Poll, the tabulators were confronted with a last-minute deluge of votes at the time of going to press with this issue. It was, therefore, impossible to make a complete and adequate final report on the Poll. This will be done in the March issue, when a tabulation of the vote for the entire country and by individual States will be made, as well as a report on the progress and general aspects of this vote, which has stimulated so much flower interest East, West, North and South.*

Fear Not, Little Brother

Flats and Sharps

Patriotism

SOME MORE BARNYARD PETS

So much comment was aroused by the presentation in these pages some time ago of two pages of pictures of the clever barnyard pets tamed and trained by the affection and persistence of Mrs. Joseph Watson of Connecticut, that when we were able to obtain more pictures of this group we quickly did so. The *dramatis personae* of this most remarkable and diversified family includes Buck, the collie,

Real Friends

A Balancing Act

At Mess Call

Taking His Measure

Guarding the Bread Line

and Laddie, his diminutive fellow canine; Tim, the kitten, and Ignatz, the white rat; Grayfriar, the vociferous rooster and Polly, the parrot, of course. One of the charms of Mrs. Watson's pictures of her strange and clever tribe is that they are taken with no attempt at background or setting and with few "stage effects". And most of all they make one wonder how any living person would have the patience to train them all. Mrs. Watson's barnyard menagerie has also appeared in the movies. Perhaps you have seen them on the screen.

School Days

Hold Fast!

Friends, One and All

Try This One!!

THIS IS *PIERIS RAPAE*

Distinguishable by the black tips and the two black spots on the forewings, and the single black spots on the rear appendages

The Cabbage Butterfly

We Pursue Our Insect Hobby One Step Further

by C. F. Greeves-Carpenter

Photographs by Cornelia Clarke

This is the second article in the series on "Breeding Insects as a Hobby", the first having appeared in the January issue.

The equipment is ready,—now for the hunt. No need for foreign conquests, however,—the vegetable garden can be the field. Here, with little trouble, most of the economically destructive insects, and a number of beneficial ones, can be discovered.

At this time of year one is likely to find a number of insect eggs in the cabbage patch, principally the eggs of the common cabbage butterfly. These are laid singly on the underside of leaves of such plants as the cabbage, cauliflower, nasturtium, turnip and radish. The eggs are onion-shaped, yellowish in color, and deeply ridged.

To prepare specimens for the breeding cages, cut off the leaf surrounding the eggs, and place them on a small portion of it in one of the pill boxes. A specimen label will read: "No. 1—egg on wild mustard. Location: vegetable garden. Date: March 15, 1930." Probably a dozen similar eggs can be obtained to make excellent material for breeding and observing the life history of the worm. Photographs may be attempted but these may or may not be very successful, according to the photographer's skill.

The collection of eggs will go in one of the breeding cages, and be kept in a warm place where the temperature is between 70° and 80°. The same conditions as are present in the garden should be maintained as far as possible. If the eggs were freshly laid it may be a week before they hatch, during which time it is inadvisable to handle them. Copious notes should be taken, to place under specimen No. 1: "three days later, noted the egg turning a darker color; the next day caterpillar had emerged. Larva light velvety green with numerous black specks. Half inch long."

The captives must now be fed and therefore some of the leaves of the plants from which the eggs were taken must be obtained, for invariably adult insects lay on plants on which the young will feed. Later leaves of various plants could be tried and notes taken on what the larvae will or will not eat. The food supply should be changed every day. The caterpillars must be lifted gently off the old leaves by hand, and care taken not to

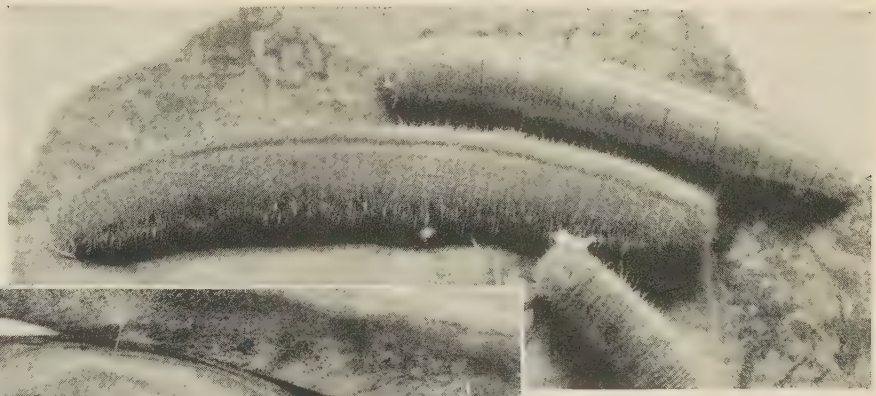
A RUINED CABBAGE

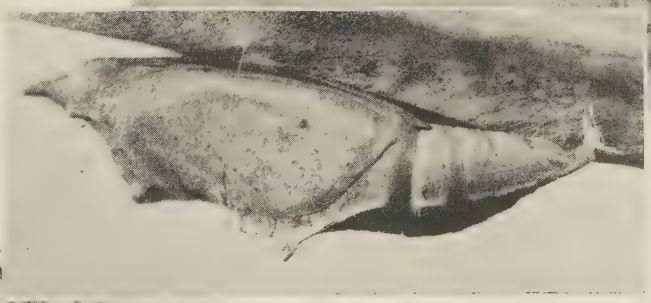
It is not much good for anything after our friends the cabbage worms get through with it

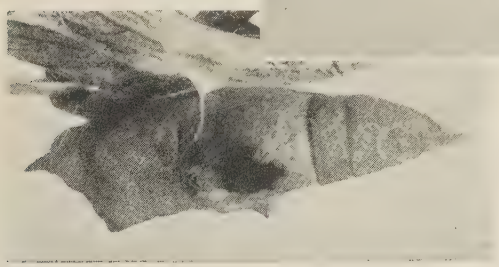
injure them by rough treatment.

From the first day after hatching interesting changes take place, for the caterpillar molts or sheds its skin four times before reaching maturity. The first molt occurs two days after emergence, the second three days later, and so on. Careful notes must mark these instars, as the periods between each molt are called.

If the breeding cage is large enough to contain a growing cabbage, the feeding habits of the caterpillar can be readily observed. It feeds on the outer leaves of the plant, making them very unsymmetrical and full of holes, and works toward the heart of the cabbage, leaving behind it a mass of dark green excrement.







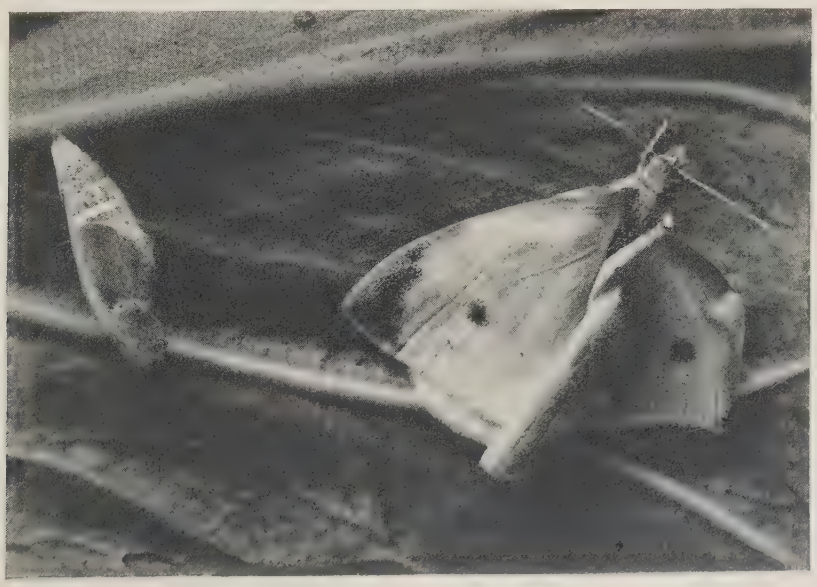
ABOVE, THE CATERPILLAR

In the center is the chrysalis, attached to the leaf; a parasitized chrysalis is pictured at the left. The last two are normally found attached hanging vertically from the leaf

When the worm is full grown it measures about one and a quarter inches, is yellowish-green with a faint yellow stripe down the middle of the back (technically known as the dorsum), and has a row of spots along each side. It differs from another similar insect that attacks cabbages,—the cabbage looper, in that it has five pairs of prolegs or false legs, and three pairs of real legs, making eight pairs in all, while the other possesses but seven.

At this stage of its existence, the caterpillar will seek a sheltered spot under an old cabbage leaf or some similar object (convenient shelters can easily be placed on the mould of the cage) and then enters the next stage of its existence which is known as the chrysalis.

First the insect attaches itself to its shelter with a silk girdle. Slowly it changes color to become, usually, quite similar in hue to the object to which it is fixed. It shrinks to approximately three-quarters inch or one-half inch less than it was in its previous form. The chrysalis stage lasts from one to two weeks during the summer time (during winter in the northern States the insects remain in this stage until the following spring), so after the sixth day the specimen must be watched very carefully. The wings, the head and the appendage form in the chrysalis, and then one day the home is rent asunder and the butterfly slowly emerges. It will cling tightly to a support for a little while, and during this time it is but a damp, draggly mass instead of the beautiful, creamy-white butterfly one would expect. This condition is only temporary, however, for after a little the wings become firm and hard on exposure to the air. With a preliminary flap or so, per-



JUST AFTER EMERGENCE

Like a wrecked airplane is the bedraggled butterfly

READY TO FLY

But a few minutes are needed for drying, then away

haps to give it confidence, the butterfly flies off in search of food. It has a long proboscis, or mouthparts extended to form a tube, through which it sucks the nectar of certain flowers. In two or three days after emergence, the female butterfly commences to lay eggs.

These common white butterflies belong to the family Pieridae, seen at any museum, so the species grown can be identified easily. The variety captured perhaps will prove to be a *Pieris rapae;* if so, the tips of the forewings will be tipped with black, with two black spots in the center of each of these wings, and but one spot on each hind wing.

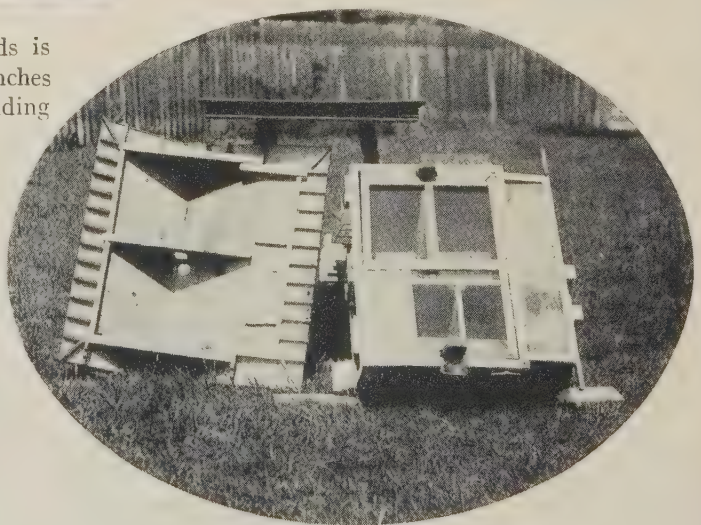
Under field conditions numerous chrysalides of the cabbage butterfly may be discovered. If some of these are placed in the breeding cages, they are liable to give queer results. Instead of the expected butterflies, numerous small flies will probably emerge. This means that while in the caterpillar stage the insect was attacked by one of its natural enemies. The "attack" took the form of the female enemy laying her eggs inside the body of the host by means of a sharp pointed ovipositor. These eggs hatched into maggots which fed on the tissues of the caterpillar and killed it. This process is one of parasitization, by means of which the natural enemies of injurious insects keep them in check and prevent their reaching overwhelming numbers. When man assists in this control work, by rearing beneficial insects to act against the injurious ones, the work is called "biological control". This method has been tried against a number of different injurious insects with excellent results, and where weather and other conditions have been favorable, good results have been obtained. The battle with the Mediterranean fruit fly in Florida is being shaped along these lines in one of its phases.

A Model Home

Birds Dwell in Style in this Avian Mansion

by Caroline Stafford

(Left) THE KEEPER OF THE BIRD HOUSE
She cares for the tenants of the perfect apartment



IT CAN COME APART FOR CLEANING
A view of the comfortable interior. Anybody want to rent?

THIS miniature bungalow built for the birds is complete in every detail. It is twenty-two inches long and nineteen and one-half wide, including the porches. The front porch runs nearly the entire length of the building, while the rear porch is but nine inches by three and three-quarter inches. The walls are seven inches in height inside, giving room for the largest denizen.

This is a four-room house; entrance is gained through two openings on the front porch, and two on the rear porch. No matter how late at night it is, a bird can find a way to its own bedroom.

There are two dormers in the roof, consisting of three windows each, thus making a total of twenty-two in the entire house. Think of all the ultra-violet rays that can get in!

The front porch is carved to represent brick; the fireplace, rough stone; and the foundation, concrete.

Ventilation is well provided for through the fireplace and the rear chimneys, and through the screen-covered nesting places. Access to the interior for cleaning is easily made by removing two screws. How delightful for the housewife! The house is painted a cream, trimmed in a light brown, the brick a buff.

SKIPPER, the MURRE

Who Lived Long Enough to Prove More than a Bird

by Ben Hur Lampman

Illustrated by R. Bruce Horsfall

SOMETIMES I fall to thinking of my small friend Skipper, and of what his friendship meant to me. He was as fine a sailor, I dare say, as ever faced the spume and anger of a nor'wester, carelessly shaking the brine from his oilskins. And he was gay of heart, too, as a sailor always should bear himself. His eye was darkly merry and his walk was droll. Few men there are, or have been, to love the great, mysterious ocean as Skipper loved it. Sir, when he looked toward it, the very breast of him swelled with a noble passion and yearning, and an inarticulate cry, as of gladness and sorrow comingled, welled from his throat. Yes, sometimes I fall to thinking of him, for if he loved the sea greatly, he loved me also in some degree. But now he is gone where sailors go when all their voyagings are over.

Skipper was a bird, silvered of throat and underparts, and raven dark of pate and wing and upper plumage. He was a minor, juvenile bird of the species called murre, sometimes styled the foolish guillemot—which signifies the foolish William—and he came ashore

"HE CAME ASHORE ON THE WHITE CREST OF A BREAKER . . ."

on the white crest of a breaker, to be drenched and pummeled on the smooth, cold sand. There we found him, trembling with chillness, his feathers draggled and gummed with the viscid oil that ships discharge at sea, to the grievous misfortune and undoing of seafowl. Death in a score of guises was near to him then, and the most cheerful of all deaths would have been merely to die. This is what men contrive, carelessly enough when they smear the brave surface of ocean with fuel oil from their commerce. A more pitiable mariner never came to land on an inhospitable coast than this same Skipper, whose mother mourned him somewhere far offshore.

"HIS EYE WAS DARKLY MERRY AND HIS WALK WAS DROLL"

We picked him up from the beach and bore him away to the cottage, and a most dreadful fear was in his heart, for he felt that death had him. When the oil had been cleansed from his plumage, and it was lard that effected this renovation, he ran ceaselessly to and fro beside the seaward wall, crying out to the sea. Not to landward, you must know, but always to seaward. A timeless sadness and longing were in the call, and it was wild as waves, and thin and shrill as the wind in the rigging, and ancient as the sea's self. Whee! Wheee! In this manner the fledgling seabird cried out to the sea. So we took him back to the sea, and he ran awkwardly toward the creaming verge of it, but upright as a man, for thus it is that the diving birds must run.

"Go back to her, Skipper! Back to her!"

Whether we meant the sea or his mother none might tell. There was gladness in his call as he plunged eagerly into the first wave. He was glimpsed in its emerald heart, swimming bravely with foot and wing. He emerged to cruise across the trough that lies between, and he thrust himself gallantly into the curve of a second wave. And so, seaward, meeting the increasing strength of the breakers, and now and again lifting himself to flutter the half-fledged wings and cry his happiness to the ocean. If he could but win past the white water he would be free of the hateful land, and perhaps he would find her out yonder waiting for him, where the blue bends down. No seaman in peril of life ever struggled more gallantly to reach the kelp-strewn shingle than this young murre to reach the open sea. But weakness mastered him at length, and the breakers tossed him cruelly. Still struggling seaward he was borne back to land in a long arc. We ran into the shallows to his rescue. Poor little Skipper.

Thereafter he learned to love us, and to know his name—to come to that name as readily, I dare say, as when his mother called in those far days that were vague to him. His progression was a stumbling haste, his thin, sharp wings flailing the air. There was something touchingly, heart-breakingly ludicrous in his coming.

"Skipper!" we would call to him. And "Whee!" Wheeee!" he would answer. The cry that had been all

sadness was now joyful to hear, yet still it was the mood of the sea, and there was a savor in it that must surely have betrayed that voice, though it had been heard in the desert. Bouncing, stumbling, running toward one's feet, and clambering with cold little webs into one's open hands —to cuddle there and to contrive minor, sleepy throatings. Ah, Skipper, you were in all truth one of the foolish guillemots.

". . . WHOSE MOTHER MOURNED HIM SOMEWHERE FAR OFFSHORE"

He dined on fish and would have none save such as were of the sea. Even trout he rejected, shaking his head with great distaste. He dined unwisely when the fare was to his liking—cod, flounder or the green-fleshed kelp fish—but Nature assoiled him of the sin of gluttony by the simplest expedients. His flight feathers grew apace, and it was his habit to spend many minutes of the day, at intervals, in the practice of those muscles which animate the wings. Always he began those calisthenics with the gay shout of "Whee! Wheeee!", and I relate but the truth when I say that neighbors came from blocks around to witness, and that they were rendered quite helpless by most healthful laughter. When Skipper thought he was flying, his wings beat blurringly, he rose to his toes, and hopped bouncingly hither and yon in a manner quite indescribable, yet withal so earnest and ebullient as to shatter the sourest visage. You must picture the fat little waistcoat of him, the absurdly human posture, the innocent conceit, the guttaperchan gambolings—but, alas, you cannot if you were not of that favored company. Whenever I think of Skipper, it is so that I see him. And at times he seems to be under my hand, snuggling close.

Too young to restore to the sea, and with a third affection taught him—well, what would you? At the end of a fortnight we left Skipper in the care of a friend, who promised that in due season the murre should be given back to the ocean. And whether our Skipper died of a change of diet, or of grief, I shall never know. For die he did, and speedily. On the fourth day of separation with admirable calmness he took leave of the world. He had lost three mothers—the murre that hatched him, the sea herself, and us. But he had lived long enough—had he not?—to prove that he was something more than a bird.

A CROW TRAGEDY

Evicted Bird Bemoans Fate

by E. I. Mason

Down in Santo Domingo there is an olive colored bird known as the palmist or palm chatterer, because of its habit of living in the royal palm trees native to that region, and because its huge nests are as familiar a part of such trees as the bark or the fruit itself. Its scientific name is *Dulus dominicus*.

But on the island of Furcy, where the species is also found, the Haitians have cut down most of the palm trees; so these birds are reduced to building in mere pines. But they retain their fondness for nests of the apartment house type, and the story is told of the crow who left his nest for forage and returned to find that the robber Dulus birds had started construction on nests of their own, using his home as a sort of cellar.

A RARE OBJECT

Natives have hacked down such beautiful trees as these

All day long, he spent hours of his time on a limb close to the robbers, crying for vengeance and bemoaning his fate; and for days and days, the scientists who were camping nearby watched him as he picketed the squatters, wolfing about his luck.

We are told that birds in their little nests agree, but in Nature it sometimes happens that they covet each others' nests, and there is no agreement. Our own fish-hawk sometimes permits the grackles to nest in the crannies of the mass of sticks he calls home, but if they tried to use it as a foundation for an apartment, he would probably object.

THE IDEAL SITE

The crows preferred the royal palms to mere pines, for their nest

AS BENJAMIN FRANKLIN SAW THE GULF STREAM
His chart, published in 1770, representing his theories with respect to this ocean current

The OCEAN RIVER *at* OUR DOORS

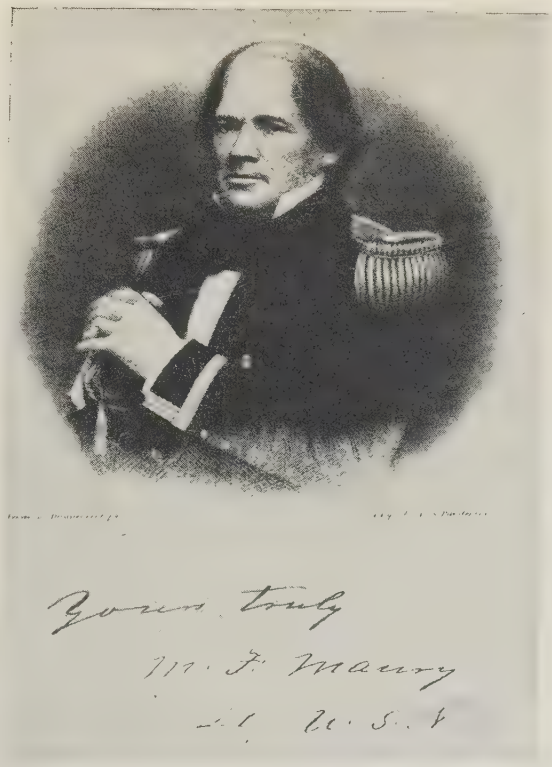
Florida's Famous Neighbor, The Gulf Stream

by Charles Fitzhugh Talman

There is a river in the ocean. In the severest droughts it never fails, and in the mightiest floods it never overflows. Its banks and its bottom are of cold water, while its current is of warm. The Gulf of Mexico is its fountain, and its mouth is in the Arctic Seas. It is the Gulf Stream. There is in the world no other such majestic flow of waters.—M. F. Maury, "The Physical Geography of the Sea."

IN FLORIDA alone, of all the states in the Union, you may enjoy the experience of standing upon the shore and beholding within easy range of vision the deep blue waters of the Gulf Stream. The sight thrills the well-informed traveler because of the many associations that attach to this most famous of ocean currents.

Benjamin Franklin gave the stream its name. Lieutenant Maury made the name a household word by the description that opens his "Physical Geography of the Sea." Long before it was named the Stream furnished one of the main highways by which colonists reached the New World, and at a still earlier period, by drifting strange woods and fruits to European shores, it aroused curiosity and stimulated voyages of discovery. But it is chiefly interesting today for other reasons. In watching it roll by the southern coast of Florida you are witnessing an operation of Nature whereby heat is transferred in enormous quantity from the tropics to the temperate zone. This heat is potential weather.



THE MAN WHO MADE THE GULF STREAM FAMOUS
Maury's description of the Stream is one of the "purple passages" of scientific literature

Ever since science first turned its attention to the Gulf Stream it has been a theme of incessant controversy. Even the application of its name is still an unsettled question. According to most authorities the stream begins

at the Straits of Florida, but the United States Hydrographic Office publishes charts in which the current that encircles the shores of the Gulf of Mexico figures as part of the Gulf Stream. Again most oceanographers are quite insistent that the Gulf Stream ends and a new member of the North Atlantic circulation begins where the Stream broadens south of the Grand Bank of Newfoundland to form what is sometimes called the "Delta of the Gulf Stream." The waters that flow thence eastward toward the shores of Europe have been variously named the "Gulf Stream Drift," the "Atlantic Stream," and the "European Stream," yet the very writers who emphasize this distinction sometimes revert to older usage and speak of the Gulf Stream as extending to the eastern side of the Atlantic and far up into those "Arctic seas" where Maury located its mouth.

The reason why there is a difference of opinion about the beginning and end of the Gulf Stream is evident from ocean charts. These show the Stream as merely part of a great eddy that makes the complete circuit of the ocean, surrounding a central area of relatively still water—the Sargasso Sea. We are reminded of the circle of Grand Boulevards surrounding the center of Paris—a single street, which changes its name from point to point—but the analogy is not exact, because there are real differences in the characteristics of this circular ocean current in different parts of its course that justify a diversity of nomenclature.

One of the controversies that formerly raged over the Gulf Stream related to the cause of its motion. Many curious ideas once prevailed on this point. A favorite notion of a century ago was that the Stream was fed by the discharge of the Mississippi and other rivers into the Gulf of Mexico, but—other considerations apart—it is now known that the amount of water supplied

COURTESY U. S. COAST & GEODETIC SURVEY

MEASURING THE SPEED OF THE GULF STREAM

Lowering the Pillsbury current meter from the survey ship "Blake." After reaching the required depth the meter is set in operation by dropping a heavy weight or "messenger," which travels down the supporting line. It is stopped in the same manner. Both speed and direction of current are measured

THE GULF STREAM

A painting by Winslow Homer which hangs in the Metropolitan Museum of Art in New York

COURTESY DAYTONA CHAMBER OF COMMERCE

FROM FLORIDA'S SHORES ONE MAY SEE THE WATERS OF THE GULF STREAM

From these dunes at Daytona Beach and from many another Florida beach one may look upon this stream which so influences the climate of the State

by these rivers is utterly inadequate to explain the volume of the current. Benjamin Franklin, who anticipated so many other modern ideas, hit the nail on the head when he suggested in 1785 that "this Stream is probably generated by the great accumulation of water on the eastern coast of America between the tropics by the trade winds, which constantly blow there." Franklin's hypothesis was long ignored, and was strongly opposed by Maury, but is now recognized to be substantially correct.

Referring again to our chart, we see that the equatorial regions of the Atlantic are occupied mainly by the North and South Equatorial Currents, which set to the westward. These currents are produced, respectively, by the northeast and southeast trade winds; which, though subject to some fluctuations, are more nearly steady and constant than any other winds blowing over the oceans. The Equatorial Currents form one huge stream of water as they approach the western side of the ocean, and here their course is controlled partly by the shape of the coast and partly by the earth's rotation, which tends to give any horizontally moving body a right-hand turn in the northern hemisphere and a left-hand turn in the southern.

Of the waters that impinge upon American shores, one branch is deflected southward along the coast of Brazil, another (the Antilles Current) is turned to the north of the West Indies and joins the Gulf Stream near the Bahamas, while much the greater part flows through the passages between the Windward Islands into the Caribbean Sea, and then through the Yucatan Channel into the Gulf of Mexico. Here some of the water takes a direct route to the Straits of Florida, and some a circuitous route along the shores of the Gulf to the same point of exit.

The Gulf Stream proper, as it issues from the Straits of Florida into the Atlantic, is the swiftest and most sharply defined of all great marine currents. Its rapid flow is due to a banking-up of the waters in the Caribbean and the Gulf of Mexico. The passages by which the water from the Atlantic enters the Caribbean are broader than the Yucatan Channel leading into the Gulf, and this channel, in turn, is much broader than the Straits of Florida, so that there is a funnel-like action that raises the level of the confined waters above the level of the open Atlantic. The extreme difference of level between the Gulf and the Atlantic is not so great as it was once thought to be—recent observations indicate that it is barely eight-tenths of a foot—but the momentum imparted by this "head" of water to the Stream suffices to carry it with river-like flow a distance of about 1,800 miles up the American coast and out into the Atlantic.

Through the narrow exit from the Gulf an average of 80,000,000,000 tons of water pours every hour, according to an oft-quoted estimate of Admiral Pillsbury. The speed of the current at the surface sometimes exceeds, in places, five miles an hour, but is quite variable, being affected by winds, tides and the distribution of barometric pressure; also, we may presume, by variations in the strength of the trade winds and the Equatorial Currents propelled by them. The water thus discharged into the Atlantic is much warmer and saltier than that of the ocean adjacent to it, and along a great part of its course it may be recognized by its deep indigo color, contrasting with the prevailing green of the Atlantic

South of the Grand Bank, in a location that varies somewhat with the season and also irregularly from year to year, the Gulf Stream ceases to be a "river in the ocean." Having lost most of its initial velocity and swung far to the eastward under the effect of the earth's rotation, it here encounters the cold southward-flowing Labrador Current, by which its progress is still further retarded and its temperature is reduced. The Gulf Stream proper gives place to the Gulf Stream Drift; a general eastward movement of waters over a vast area under the influence of the "prevailing westerly" winds, at a speed averaging one-sixth to one-seventh that of the Gulf Stream off the Florida coast. A branch of the Gulf Stream Drift turns southward on the eastern side of the Atlantic and eventually joins the North Equatorial Current; other branches flow off to the northeastward, passing the British Isles and the Norwegian coast and penetrating far into the Arctic Ocean; and one, swinging off to the northwest, passes through Davis Strait to Baffin Bay.

In the foregoing brief description of the Gulf Stream and the currents connected with it, we have noted the part played by the winds in maintaining the movement of the waters, both in the trade-wind belt to the south and in the region of westerly winds to the north. The winds are by far the most important agency in controlling ocean currents and, as carriers of heat and moisture, they spread the influence of these currents over adjacent lands. The relations of winds to currents are, however, extremely complex and puzzling, because, while the currents are driven by the winds, the latter are profoundly influenced by the currents. This influence is exerted through the effects of water temperature upon the temperature and hence upon the density and pressure of the overlying air. Cold water tends to build up a high-pressure system, with a certain circulation of winds around it; warm water, to build up a low-pressure system with a different circulation of winds. Both the direction and the force of the winds are controlled by these pressure systems. In the North Atlantic there is a vast permanent "high" or anticyclone on the border of the tropics, variations in which affect the strength of the trade winds, and there is a persistent "low" or cyclone, located often enough near Iceland to have acquired the name of the "Iceland low" (though it sometimes travels far from home), which has a great deal to do with the kind of weather wafted by the ocean breezes to the shores of Europe. Lastly, although in middle latitudes there is a general drift of the atmosphere from west to east, the so-called "prevailing westerlies" are frequently interrupted locally by small eastward-moving cyclones, with their attendant winds, and in crossing the ocean these cyclones doubtless vary somewhat in intensity with the temperature of the water over which they pass.

The weather of eastern North America is much affected, through the action of the winds, by barometric conditions off the Atlantic coast, and therefore cannot be entirely unaffected by any changes that may occur in the temperature, location and area of the Gulf Stream. The amount of influence exerted by the Stream in this connection is, however, quite problematical.

Europe lies far away from the Gulf Stream proper, but adjacent to the huge expanse of the Gulf Stream Drift, which is a body of relatively warm water, and from which the winds blow prevailingly toward the land. The mean sea temperature off the Hebrides is more than 47° higher than off the American coast in the same latitude and in the course of the Labrador Current. While it is true that the mere presence of an ocean to the windward gives western Europe an equable climate, the relation of ocean temperatures to the mildness of the climate is illustrated by the fact that in the Faeroe Islands when the wind blows from the Gulf Stream Drift to the south and west the air is 12° warmer in winter and upwards of 3° warmer in summer than when it blows from the cold East Iceland Current to the north. If the warm waters west of Europe were replaced by cold, the climate of that continent would certainly be much altered, and it can hardly be doubted that temporary variations in the warmth of the waters are reflected in European weather.

There has been much talk about the possibility of making long-range weather forecasts, especially for Europe, on the basis of temperature measurements in the Gulf Stream, or perhaps of going even farther back in the chain of events and predicting European weather from the strength of the trade winds. These projects assume that the warmth of the Gulf Stream Drift is due mainly to heat brought from the tropics by the Gulf Stream, and they also depend upon the fact that the waters of the ocean travel slowly—taking several months to cross from Florida to Europe and more than a year to

(Continued on page 126)

A Trinity *of* Loveliness

Columbines Possess Handsome Flowers, Graceful Stems And Beautiful Foliage

by Albert A. Hansen

THE LONG-SPURRED COLUMBINE
One of the finest of the new varieties gracing the garden plot

HAVE you a rock garden, a border that needs new life, a rocky ledge that needs a touch of color, a wooded area to be beautified? Then you have the background for one of our loveliest and best-mannered garden perennials, the graceful, nodding columbine.

There is a certain delicacy and colorful charm attached to columbines that no other garden plants possess. Where else can be found such sheer beauty of floral form and color, such graceful stems to give magnificent carriage to the entire plant, such singularly attractive fernlike foliage? This trinity of beauty cannot be matched in the entire realm of garden plants.

Columbines are perennial members of the genus *Aquilegia* in the buttercup or crowfoot family, although three species, *caerulea, glandulosa* and *vulgaris,* cease blooming after the second or third year and are best handled as biennials.

Although most species of columbine grow naturally in rocky or gravelly situations, they respond well in almost any well-drained soil except in the lighter lands of the southern states. Aside from southern California, columbines do not thrive in the South.

The cultivation of columbines in Europe and Japan is many centuries old since the beautiful plant has long been a garden favorite. The discovery of America added a few new species to the European and Asiatic forms, the principal new world kinds being the red columbine, *A. canadensis,* of the New England and middle Atlantic states; the Colorado or blue columbine, *A. caerulea,* of the Rockies; the striking golden columbine, *A. chrysantha,* of New Mexico and Arizona, and the Mexican columbine, *A. skinneri,* from the mountains of Mexico. Although these species have all been

A WINSOME BOUQUET CHALLENGES THE EYE
The last few years have seen the columbine rise to new heights of popularity

J. C. ALLEN

brought under cultivation, aside from the double forms, believed by many to be less attractive than the wild kinds, they have been little changed by the art of the gardener and plant breeder. There are numerous horticultural varieties, however, of the common European species, *A. vulgaris,* mainly in shades of purple and white.

In general, columbines thrive best in light, well-drained, fertile sandy soil in a sheltered position that is not deprived entirely of sunlight, but they seem to do well massed in clumps in exposed borders as well as at the edge of wooded areas and in the shade of trees. I have in mind a rocky slope in the garden of a city home that is spotted with brilliant patches of columbines nodding gracefully from rock ledges, giving a touch of color under trees and even competing with turf for a chance to express themselves.

Columbines are charming alike in permanent borders, at the edges of shrubbery, in rock gardens, along wooded paths, under the shade of garden trees or as cut flowers. They are best started from seed, but they may later be perpetuated by division. Few hardy garden plants are so readily grown from seed, which may be sown indoors in shallow boxes or in coldframes during March or outdoors during April. Early sown seed sometimes gives floral reward during the first season but ordinarily blooms do not appear until the second year. They present a wide color range, varying from pure white to exquisite clear blue, and through lovely soft shades of rose, yellow, purple, red, orange, cerise, salmon and mauve. There are even some striped forms. The dainty, dancing spurred blossoms pirouette at the slightest caprice of the wind, reaching their greatest display during May and June.

One problem in rearing young columbine seedlings is that of keeping the surface of the soil moist. This seems to be necessary if the plants are to survive, but too much moisture encourages the damping-off fungus, so careful regulation is necessary. When started in coldframes the recommendations of Fred H. Horsford, well known Vermont nurseryman and flower grower, seem to overcome this difficulty. Horsford's method is to cover the coldframe with medium heavy cotton which retains just enough moisture to keep the soil in good shape while at the same time permitting sufficient air circulation to ward off the dreaded damping-off. Seeds sown in the open, however, escape these difficulties but the seedling soil must be kept moist. When the coldframe seedlings reach sufficient size they are transferred to the open where they must be given shade for a few days until firmly rooted. Once started, columbines respond well to ordinary garden culture. In the colder parts of the country a mulch of leaves or straw may be necessary during the winter. Occasionally, particularly in too rich soil, the foliage becomes a bit shabby but this fault is easily corrected by trimming, since the perennial roots soon renew leaf growth.

Raising one's own seed in the garden is a simple matter providing but one variety is

FOR GARDEN BORDERS

One may choose the common variety, above, or the native Colorado blue, in the oval

(Below)

THE GOLDEN COLUMBINE

This is a native of the Southwest, adaptable to rock gardens or borders, or suitable as a cut flower

grown. Where several varieties are raised they must be widely separated, since practically all columbines hybridize freely. It is for this reason that columbines, even from the best seedsmen, may not always come true to name and one must be exceedingly charitable in this respect. A desirable feature of columbines is the fact that the red species, of which our native *A. canadensis* is an example, attract busy little ruby-throated humming birds that attend to the business of pollination.

There are over a score of species of columbines with dozens of varieties that offer a wide selection of form, habit and color. For ordinary garden purposes the Mrs. Scott Elliot strain of long-spurred hybrids, an importation from England, is perhaps best. The long-spurred hybrids are the latest and finest products of the columbine breeder's art and they are now offered by practically all dealers in mixtures that include a bright display of white, blue, pink, rose, red and yellow, no two flowers seeming to be exactly alike. The long-spurred hybrids are strong, thrifty plants growing to a height of about two feet with large, charming flowers that appear during spring and early summer. Fortunately, these new perennial creations do well in ordinary garden soil and they are well adapted for borders or bouquets.

When pure species of columbine hybridize in the garden the result is usually an undesirable strain. Aside from the long-spurred hybrids, the most popular garden species for borders, clumps and cutting are the native red columbine, *A. canadensis,* the native Colorado blue or Rocky Mountain columbine, *A. caerulea,* and the English *A. vulgaris.*

E. L. CRANDALL

WHAT COULD BE MORE DAINTY?

One of the important reasons for the columbine's steady climb to flower fame

The native red columbine, although frequently found in gardens, is a true creature of the wild that loses much of its graceful charm by sprawling out when cultivated. Seeds may be gathered and sown during midsummer for bloom the following season. It is a most attractive species with red, yellow-throated blossoms that appear from April until July. Its favorite haunt in the wild is on woodland limestone ledges where the bright blossoms dance in the wind like tiny balls of fire.

The Colorado columbine, the floral emblem of its native state, is particularly attractive with its large sky-blue to white blossoms measuring sometimes three inches across, and its long, slender spurs tipped with greenish knobs. The entire plant grows to a height of about eighteen inches, the leaves are three lobed in true columbine style and the plant is of easy culture in well-drained sandy soil in exposed situations. The horticultural variety, *A. florepleno,* features large double blossoms that are too crowded to be considered much of an improvement over the wild form.

A common garden variety of the English *vulgaris* species is *A. nivea grandiflora,* or Munstead's White, noted for its profusion of huge, pure white blossoms borne on stout stems that curve gracefully under the weight of the flowers. The blooms appear early, a worthy vanguard for the long-spurred hybrids that make their floral début later. Munstead's White does best in a somewhat sheltered situation with plenty of sun and is well adapted for borders, cutting or rock gardens. This variety is best started from seed and is a true perennial of easiest culture that may later be propagated by root division, as may most species of columbine.

A fine American contribution is the golden columbine, *A. chrysantha,* a native of our own Southwest that attains a height of three to four feet. The numerous bright yellow, fragrant blossoms with slender spurs sometimes exceeding two inches in length, are poised vibrantly on long slender stems. The attractive foliage is somewhat darker than in other species. It is a hardy perennial adapted to rock gardens, borders or for cut flowers, that may be propagated by division of the clumps or by early sown seed to which it usually comes true. A variety *alba* has pale yellow blossoms merging to pure white that are unsurpassed by any garden flowers.

Among the best of the rock garden species is *A.*

glandulosa, a lovely plant that seems distinctive in not crossing freely with other varieties. Then there is *A. alpina*, the alpine columbine, another fine rock garden form with showy blue flowers. This thrives best on sandy loam or peat soil in a moist, sheltered situation that is not too shady. A charming variety, *superba*, may be had with white-centered flowers. Closely allied is *A. reuteri*, at home in the open in poor soils. America has also contributed a miniature alpine species, the fine little *A. jonesii* from the Rockies that is unusually well adapted for rock gardens.

The well known *A. viridiflora*, a species with curious sage-green flowers and delicately tinted leaves that impart pastel effect, cannot be neglected, and there are also many devotees to the Californian columbine, *A. formosa*, a singularly beautiful species somewhat resembling the common red columbine, that thrives in rich, moist places. It hybridizes readily and is unusually attractive on account of the manner in which the petals are edged and lined with gold. The Californian columbine is native to western valleys as far north as Alaska. Then there is the popular *A. skinneri* from old Mexico, an exquisite species with orange flowers possessing bright red spurs. Although offered by many dealers, the true form of *A. skinneri* is said to be rare.

As with all popular garden plants, novelties appear from time to time. A novelty form is *A. longissima*, distinguished by the unusually long spurs.

A number of Siberian species, handsome affairs with lilac-blue blossoms, short, blunt, incurved spurs and included stamens, have lately appeared in increasing numbers on the American market. Among the best of Siberians are *A. glandulosa, A. oxysepala* and *A. sibirica*. All of these forms are as vigorous and hardy as lilies but must be treated as biennials.

From the gentle clime of Japan comes the fan columbine with white corollas set off by lilac sepals. Thus all corners of the northern hemisphere from Japan to Siberia, Europe, Alaska, America and Mexico have contributed fine species for the home garden.

An excellent quality of garden columbines is their relative freedom from pests. Their worst enemy is the borer, a striped larvae that tunnels the stems and causes the entire plant to wilt and droop. Usually all that is necessary to defeat the plans of borers is to pull and burn the first crowns that show signs of this trouble. The handsome, maiden-hair-like foliage occasionally becomes disfigured by leaf miners, tiny fly larvae that feed between the leaf surfaces leaving light-colored, serpentine trails in their wake. The infested foliage should be stripped and burned as soon as miner injury becomes apparent. The miners can also be repelled with a nicotine sulphate solution. Spading the ground around the plants during March before the flies emerge is helpful.

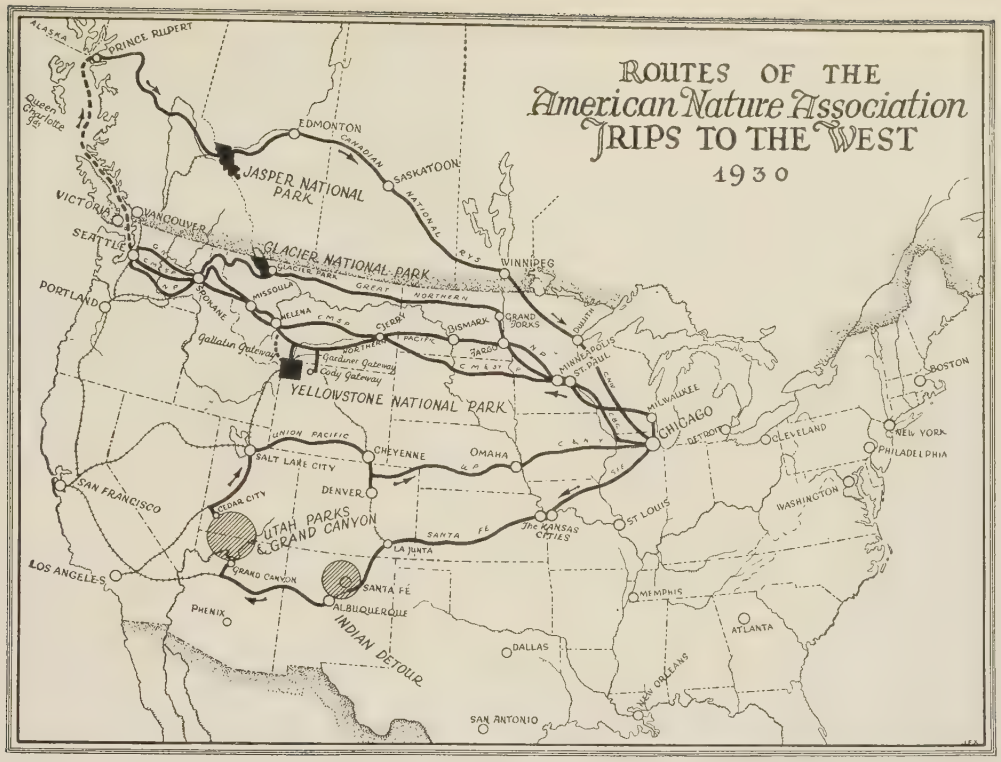
The only other insect enemy that has been reported on columbines is the common aphid or plant louse that occasionally stunts the growth by clustering on the terminal stems. Once again spraying with a nicotine sulphate solution or an application of nicotine dust will prove highly beneficial. These materials may be purchased from dealers and directions are usually furnished. The common form on the market is a forty per cent nicotine extract that is usually diluted with eight hundred parts of water for ordinary garden work.

A single fungus is known to be destructive to columbines, the southern root rot, if the damping-off fungus of seedlings is excepted. This is the same parasite that attacks iris, phlox, golden glow and other ornamentals. Southern root rot can be controlled by watering infested plants lightly with corrosive sublimate dissolved one ounce in twenty gallons of water, or with a similar solution made from one of the new organic mercury compounds that have recently appeared on the market and that are now offered by dealers.

The charming characteristics of the columbine are unique in flowerdom. For the part it plays in the garden it has no rivals to take away its glory. To see its sprightly tri-parted leaves surmounted by the delicate blossoms nodding on their graceful stems along a border or in a rock garden is to realize that the claims made for it are not exaggerated. It is truly a trinity of loveliness.

INSIDE AND OUTSIDE THE GOOD YACHT *CAROLINE*

Views of the yacht which, with her sister ship the Westward, *will carry members of Nature Magazine parties through the Inner Passage of British Columbia from Seattle to Prince Rupert during the coming summer*



On Western Trails

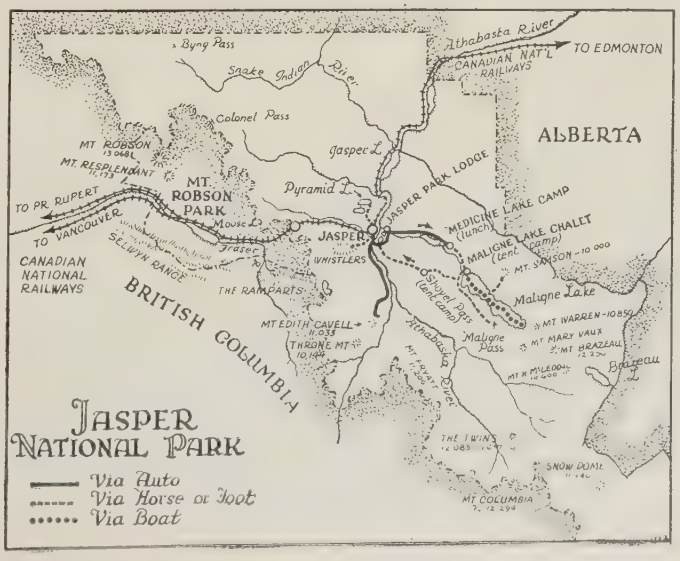
American Nature Association Announces Its 1930 Trips

THROUGH the mountains and beside the lakes of Jasper Park, Canada; into the bays and inlets of the untouched wilderness of British Columbia's Inner Passage; over the trails and to the chalets and tent camps of Glacier National Park; to the many wonders of Nature at play in the Yellowstone, and into the region of color and grandeur in the Southwest, American Nature Association parties will go this year.

The three parties that visited Glacier National Park during 1929 proved beyond any doubt the value and appreciation of such an endeavor. They proved that the worthwhile people who form the membership of the American Nature Association and the readers of Nature Magazine are eager for what is at once a real vacation in the outdoors and an experience of permanent value. Also, they provided something different in summer trips.

At the earnest urging of members of the 1929 parties and because there is no inconsiderable responsibility to continue this activity, we have been at work for the past several months on more extended plans for 1930. These plans are so varied geographically, and cover so much of interest that it is impossible to present them in detail in the pages of Nature Magazine. A booklet has been prepared, however, and given the title *On Western Trails with the American Nature Association.* It will be mailed to all interested.

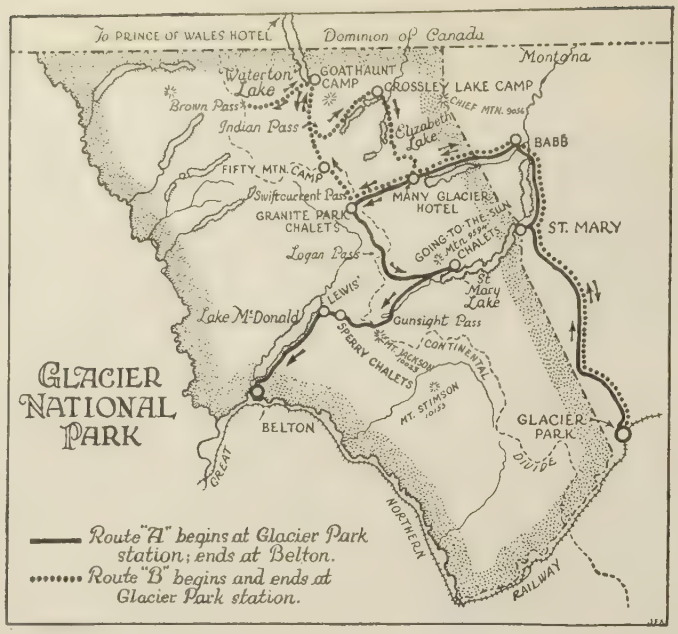
Briefly, however, it may be said that the trips that link Jasper Park in Canada with Glacier National Park, by way of a private yacht trip through the Inner Passage of British Columbia, are not duplicated anywhere, and may be safely described as one of the most notable outdoor experiences available. The Yellowstone, mecca of thousands of tourists every year, is a Park which should be in the experience of everyone and will be seen by our parties from our particular point of view. For the Southwest there has been mapped out a trip which includes all that can conveniently be



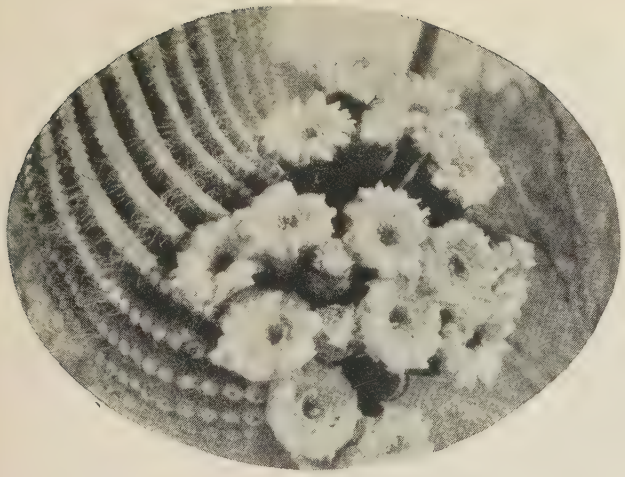
covered in one trip to this section, having, at the same time, sufficient leisure to gain the sort of knowledge of the country that our parties seek.

For the glorious yacht trip up and down the Inner Passage of British Columbia, the American Nature Association has chartered two yachts, the *Westward* and the *Caroline*. Many will recall that the *Westward* carried our expedition to the Pribilof Islands and there proved her ability in any kind of seas. The *Caroline* is her sister ship. Both are outfitted with equipment for camping ashore and with small boats for the various adventures the party will have in this primeval country where Nature reigns supreme. Few see the Inner Passage and its shores as the American Nature Association parties will see it, because the larger boats to Alaska must stick to the deeper channels while our yachts will find night anchorage in secluded and, often, unnamed bays. We cannot conceive of a more perfect vacation for one who loves the outdoors than a trip which links Glacier Park and Jasper Park by way of one of the most fascinating bodies of water in the whole world,—the Inner Passage.

All of the parties will be limited to not more than twenty members, and in two instances to fewer. In reality they are family parties with representatives of the Washington office as nominal heads of the families and with our naturalists along as "one of the gang". The American Nature Association trips are not tours in the usual sense of rushing from one point of interest to another in large groups. They are not commercial enterprises. They are, instead, trips for those who love the outdoors and what it holds, who are "good sports", who are willing to take the fortunes of the trail as they come and who want to take back from their vacations more than hurried glimpses of what they have seen.



On these pages there are reproduced maps showing in general and in detail the routes to be followed by the several parties that will go afield this year. However interesting such maps may be, obviously they can hardly hope to more than suggest the beauty and charm of the country to be visited by the various groups. In the booklet, *On Western Trails,* we have attempted to describe with words what one will see and do, and even these often seem inadequate, particularly to those of us who have already visited Glacier, Jasper, the Southwest, the Inner Passage and the Yellowstone. Send for the booklet, however, and see whether it does not describe something of interest for your vacation plans and something different.



(Left) FLOWER OF THE SAGUARO, OR GIANT CACTUS STATE FLOWER OF ARIZONA

At the right is a giant cactus in the Tonto National Forest of Arizona

Our VANISHING CACTI

Commerce and Carelessness Threaten These Distinctive Native Plants

by Marian MacLean Finney

IN THE quivering heat of the desert, two passengers leaned back against the cushions of an automobile moving slowly along the road. They were a trifle bored with the gray-greenness and the dust. Suddenly one leaned forward, caught by the view of patches of red and yellow, pink and purple, which festooned the ground or stood like apparitions between them and the sun. The car halted with a jerk. There were exclamations of wonder. The ennui of the desert trail was over. From then on the desert sands had a message.

The color was that of flowers,—strange flowers, gorgeous but stiff, handsome but unapproachable. They were growing grotesquely on plants of a most forbidding and churlish appearance: thick, leafless, jointed stems from which protruded numerous and dangerous thorns. They were tall or short; a gray-green, barrel-shaped mound; a clumsy-looking, branching bush; a small tree, or merely a series of spiny balls along the ground. There were a few large and showy single flowers, and cluster of tiny ones. Some thorns or spines were long and sharp as a bayonet, others took the form of hundreds of stickers so fine they could scarcely be seen. Innumerable were the variations.

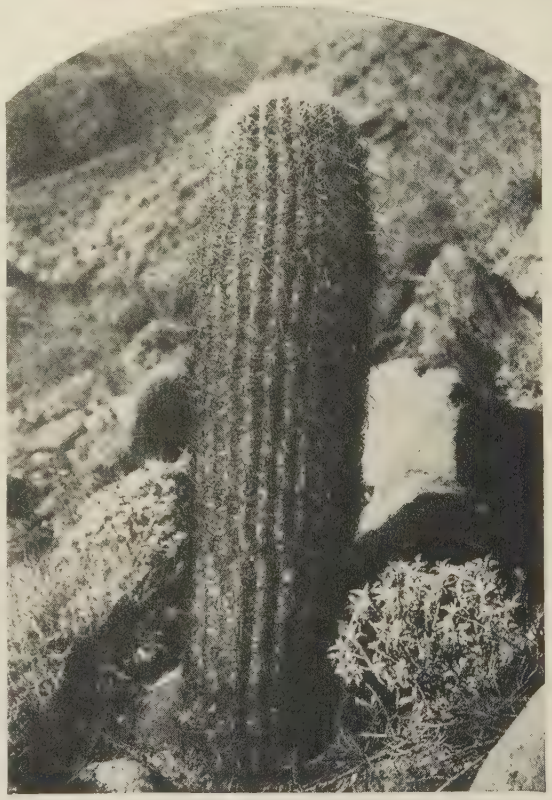
Among all this numerous family of cacti, only a few disreputable members are well-known, such as the "horrible cholla" which sheds its spines on every passing object, inflicting painful wounds. Most of these kinfolk, however, have lived to some purpose. The tiny burrowing animals count their cruel appearance a blessing, and birds take to their branching arms for refuge, both depending upon the thick barbs to repel enemies. The Indians used thorns of cactus for fish hooks and for needles; ate their fruit raw or made it into jelly; and distilled a cooling beverage from their juices. The early Spaniard planted them for fences and enjoyed their decorative effects in his garden. Within the last decade, Luther Burbank developed a variety without spines to be fed to cattle and horses, a rival of the nutritious alfalfa. The modern candy factory keeps the desert roads alive with trucks, hauling away,—often to a shameful waste,—thou-

CHOLLA CACTUS, COLORADO DESERT, CALIFORNIA

A disreputable member to the human but a haven to burrowing animals and the birds

sands of plants, usually the large barrel cactus. In Mexico, cactus is made to yield both rubber and varnish, and everywhere curio makers carve from it pin cushions and napkin rings, bowls and baskets.

Thus the cactus, for generations, has befriended man, and now man has awakened to the fact that he must defend the cactus, for many varieties are repeating the tragedy of the American buffalo, the desert big-horn sheep, and numbers of our birds and wild flowers. They are disappearing fast and needlessly through the carelessness of those who seek them for various purposes, and through ignorance of their habits and helpfulness. In order to protect them and certain related plants, a "Cactus and Succulent Society" has recently been organized, with headquarters in Los Angeles.



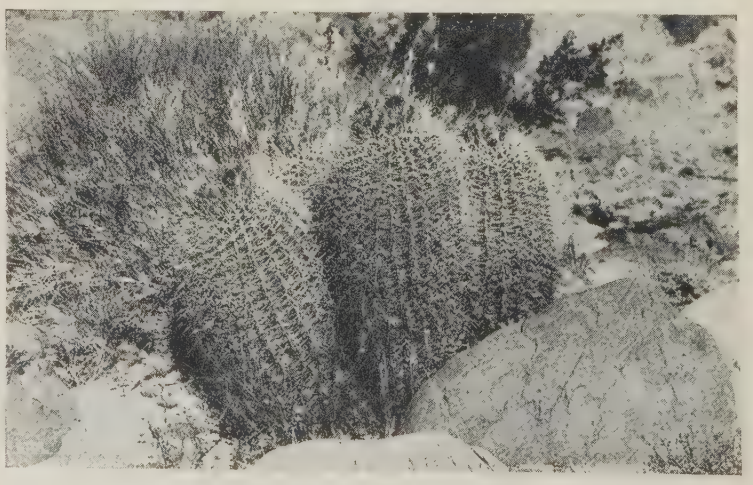
A LARGE BARREL CACTUS
Thousands of these plants are being hauled from the desert

Despite its recent organization, the society now has nearly three hundred members scattered from New York to California, and from Texas to Canada. Several branches have been formed in different parts of the country, working under the Los Angeles headquarters. A friend who desires to remain anonymous to the public has offered the new Society a ranch of one thousand acres in Arizona, but this brings with it the grave question of development expense, water and other details, and so this generous gift may have to be refused altogether or its acceptance delayed until the Society has sufficient funds in hand for a steady payroll. It is imperative, however, that some ground shall be secured as soon as possible in order that certain nearly extinct varieties may be planted and conserved, in much the same manner as the Government has established forest reserves.

Botanically, this Society is interested in the Xerophytes, natives of dry habitats like our deserts, and in the Halophytes which grow in saline soils. Both families are distinguished from other plants by their more-pronounced water-storing tissues and for surfaces which neither absorb nor exude moisture to any extent. This means thick stems, firm skin, small leaves or none at all, and sometimes spines. Examples of these plants are known to most of us by their common names, such as the century plant (rather than "agave"), hen-and-chickens, yucca, cactus, and by far the more numerous are the cacti and their progeny.

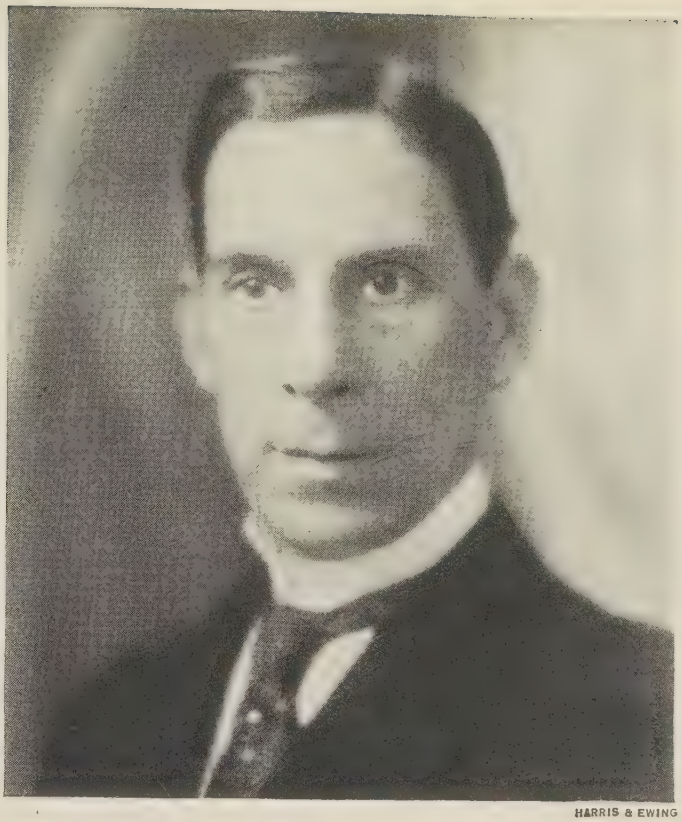
They deserve protection, for they have lived usefully but not easily. The roots of the cactus must penetrate deep into the earth to draw even a feeble sustenance, and it has had to change the normal manner of plant-life by dispensing with the beauty and utility of leaves, and by hardening its skin to keep from giving out its moisture in evaporation. This tough covering, with its numerous bristles, shuts out the rays of the fierce desert sun, as well as shields the plant from the raids of large herbivorous animals that would feed upon the life-giving moisture hidden within its thick stem and roots, so hardly wrested from a discouraging soil.

The cactus deserves our admiration because of its bravery and persistency under adverse conditions, where other plants have mostly given up the fight. For this, it appeals to our sense of fair play that it should now be given a chance for its life. Furthermore, it appeals to our patriotism because it is a native American. From the United States, as well as from Mexico, it has been carried to other parts of the world, its unusual beauty and its usefulness appealing universally. Most of all, its helplessness appeals to us. For two centuries and more we have availed ourselves of its aid. Now shall we see it despoiled and wasted?



WELL-NAMED THE HEDGEHOG CACTUS
At last these plants of the desert have an organization seeking to protect them from the inroads of commerce that they may not be wiped out

This new Society plans a campaign of education. Summer campers will be asked to let it grow. School children will be instructed in its care. Householders will be enlightened as to its points of beauty for garden decorations. The Society will also foster appropriate legislation which will make it unlawful for commercial houses (like candy companies) to over-exploit it.



HARRIS & EWING

SECRETARY RAY LYMAN WILBUR
Head of the Interior Department, who calls for action in conservation

HE STARTLED THE ENTIRE NATION
By his proposal to give the public lands back to the states

ORPHANED ACRES AND UNCLE SAM

What Secretary Wilbur Thinks of Both

by Paul F. Hannah

Assistant Editor, Nature Magazine

"THE United States Government has played dog-in-a-manger with the 186,000,000 acres of public land long enough.

"If it will not act, and promptly, to protect them from fire and over-grazing, to save the water supply vitally necessary to the West, then the states, which could do no worse in the next twenty years than the Federal Government has in the past twenty, must take charge.

"The day of the bureaucrat, utterly ignorant of conditions two thousand miles away from his Washington office, the day of no control, which has practically permitted anyone, at any time, to do what he wished with the surface of government land, is at an end.

"Now is the time for *conservation*. The era of words is over."

The speaker was Secretary Wilbur. His voice thrilled with conviction. He snapped out his words like a general giving commands. His eyes, always keen and bright, burned with the intensity of his thoughts. He typified action.

"Water is the key to the future in the West," he went on, his sentences staccato. "From Nebraska to the Pacific, the great states can grow only as they find it, store it, preserve it. Behind the water lie the plants, preventing erosion and protecting the watersheds.

"What is happening? Now the plants are cut to the ground by over-grazing, burned to the roots by fire. Each rain brings thousands of tons of earth away from the hills, choking the reservoirs and tearing down the watersheds, because there has been no adopted policy.

"Here!" He jumped to his feet, unfolded his great height of six feet four, and reached up to the map of the United States covering one wall of his office in the Interior Building. His long arm moved up and down the West Coast; his tapering fingers, long-trained by practice of medicine to delicate touch, traced in and out of the Western Valleys.

"I know this country. Once covered knee-deep with bunch-grass, capable of feeding mighty herds, capable of holding the earth with its roots against torrential rains, and storing up the water, to give it up in more even quantities to the rivers. Now what? Bare, brown stretches, cut by gullies that each rain deepens, because of over-grazing. The forage is gone. Erosion is taking its destructive toll. Another great American Desert is in the making.

"This is government supervision. If it is the best the government can do, let the states have a try, as I recommended in my Boise, Idaho, speech."

Because of the now-famous Boise speech I had been sent by Nature Magazine to Secretary Wilbur, to find out more concerning his public land beliefs. He had aroused the country when he said, "It is time for a new public land policy which will include transferring to those states willing to accept the responsibility the *control of the surface rights of all public lands not included in national parks or monuments or in the national forests. With sound state policies based on factual thinking it may eventually develop that it is wiser for the states to control even the present national forests.*"

Editorials, many opposing his ideas, had filled the

U. S. FOREST SERVICE

AS MANY ACRES LOOK TODAY

The Government has largely abandoned its orphan acres allowing them to be over-grazed and ruined

press. Indignant groups of foresters fell on his suggestions regarding the national forests, and they tore them piecemeal with a fear born of the days when the Interior Department was selling forest lands wholesale. Under the storm he had retracted nothing. What was he going to do?

He had received me with courtesy. I told him what I wanted.

"Do you come here to talk Nature or politics?" he had asked. "I am not interested in political machinery but in results. The desert plants and those of the mountain side want rain and nourishment, and do not know in which state they are living. All I care about is seeing that they obtain what they need and gain protection, regardless of whose jurisdiction they are under. State or National government—it makes no difference which agency does the work, provided it is done."

I professed my ignorance of things politic. But what did Mr. Secretary have in mind when he spoke in Idaho?

A slow smile played over the thin face. It broadened to a grin. One might imagine that sitting there, instead of the Secretary of the Interior, was the Stanford schoolboy of thirty-five years ago, up to some collegiate manoeuvre.

"You will have to admit the talk startled many people. Perhaps that was what I had in mind. After years of inactivity, only bombshells are effective as alarm clocks. Now every person is focussing his gaze on these myriad plants, that are so important in our future development. Perhaps, now, we can get somewhere!"

So this was the reason! Secretaries of the Interior had come and gone. The Land Office had drowsed through the winter winds and the summer heat in its Washington home; Congress had met, talked and adjourned on Capitol Hill, as Congresses do; the states, too, had had their fill of sleep, while the great land problem remained unsolved and ruination went on apace.

Real estate—acres of sage and forage, stretching flatly under a blazing sun—was prosaic; it lacked color, romance. A new secretary stepped in, and, by a brilliant manoeuvre, gave the land problem its glamor. He set tongues wagging, either in praise or condemnation. Very few could do that. And very few could sit in their offices days after day, chuckling over the withering or effulgent telegrams that have followed in the wake of such a speech.

Few realize, even yet, the immensity and importance of the question Doctor Wilbur hopes to solve. It involves on one hand endless tangles of government red-tape, on the other an almost impossible coordination of activity and unity of purpose among and within the states. The answer depends on an understanding of the proper relationship, to the life of the nation, of the different assets of the public domain—the forage, the watershed, the minerals, forests and farming possibilities, and a very nice adjustment of the values of each. It likewise requires Congressmen to cease their log-rolling tactics, and to forget the minor interests of special groups of their constituents to preserve the major interests of the nation.

History shows, however, that Doctor Wilbur's plea has been too long postponed. Once the great desert areas of Palestine fed thousands of head of cattle. It is recorded that on one occasion the children of Israel went forth to war against the Midianites, and brought back over 740,000 animals as booty—and this number probably represented only a small portion of the number that then grazed over the land—yet today Palestine is arid, barren, and treeless, because of overgrazing, and its usefulness reduced to poor agriculture and stock raising. When Coronado made his courageous journey from Mexico northward to eastern Colorado and western Kansas, along what later became the Santa Fé trail, his historian reported: "Who could believe that one thousand horses and five hundred of our cows and more than five thousand rams and ewes and more than fifteen hundred friendly Indians and servants in travelling over these plains would leave no more trace where they had passed than if nothing had been there—nothing—so that it was necessary to make piles of bones and cow dung now and then so that the rear guard could follow the army." One merely has to travel the Santa Fé trail today to learn the lesson.

"But perhaps now we can get somewhere," before it is too late. Shortly after Doctor Wilbur's speech, President Hoover appointed his Commission on Conservation and Administration of the Public Domain to discover how grazing can be controlled, how the watersheds can be preserved, what the function of the Reclamation Bureau shall be, and how the ideals of conservation may be established. It is headed by James R. Garfield, and composed of men who are conservationists at heart, and who know the West.

Nor is this committee bound to bring in a report in accord with any pre-conceived policy. There will be no "rubber-stamping" of Doctor Wilbur's professed beliefs. Already, after the first meeting on November 23, it is clear that within the committee itself there are diverse opinions that can be reconciled only after the question has been given the thorough study it deserves.

Doctor Wilbur, however, is frank to admit he is opposed to "absentee landlordism" and the "bureaucrat."

"What does a bureau official in Washington, who has never seen Nevada, know about grazing there? How can any Washington office lay down uniform rules to apply at the same time to Idaho and Arizona?" he asks. "Water is vital to the life of the states, while it is only the academic concern of those working in the Capitol, and they cannot properly understand and control problems connected with it from a distance."

The states, he believes, will in self-preservation take care of their public lands. They have done well with the school lands previously given them, and have already machinery which will be able to handle advantageously the administration of additional territory. No commonwealth is going to sit idly by, he feels, to watch another state out-distance it because of better management of the grazing problem. The states know local conditions. They know how to meet them in private enterprise.

Of course, there are many instances where the watersheds of one state supply water to another—as Montana's mountains furnishing the life-giving supply for the plains of Utah. In such cases, Secretary Wilbur believes, regional agreements—treaties or compacts, if you like—will work out the problem.

But what of corrupt legislatures? Of governors bought and sold by the grazing interests? Doctor Wilbur admitted that here was a matter giving pause for thought. But he had an irrefutable answer.

"If the states do nothing, they cannot do worse than has the national government."

He indicated with a wave of his hand four books sitting on a table behind him. These were the beautifully bound volumes containing the report of the Public Land Commission appointed by Roosevelt twenty years ago. The Commission, in 1905, had warned the country that grazing must be controlled, and the range restored, or the West would be destroyed. It had secured the National Forests, but the range had been forgotten.

The sweep of his arm was dramatic. It indicated, clearer than words, that the beautiful bindings were the chief tangible product of the months of investigation of the range's needs.

"Of course," he pointed out, "no lands can be granted the states until the ideals of conservation upon which the future of the nation depends become inscribed into their policies. They must first be shown how necessary to their very existence Conservation is. The broad policies which each commonwealth must follow will be established by Congress in giving the surface rights to the lands. They will administer them in accord with these policies. Perhaps it will be desirable to insert a condition subsequent in the grants, causing the land to come back to the government if mismanaged. Every safeguard will be put around the public domain.

"But until we can take a step, we must await the committee's report."

Such, then, are Secretary Wilbur's ideas on the public land question. They label him as a deep-thinking, yet active conservationist. For him, conservation is no academic affair, to be the object of idle theorizing. It is fundamental—immediate. It calls for a solution, one divorced from politics, from every factor but

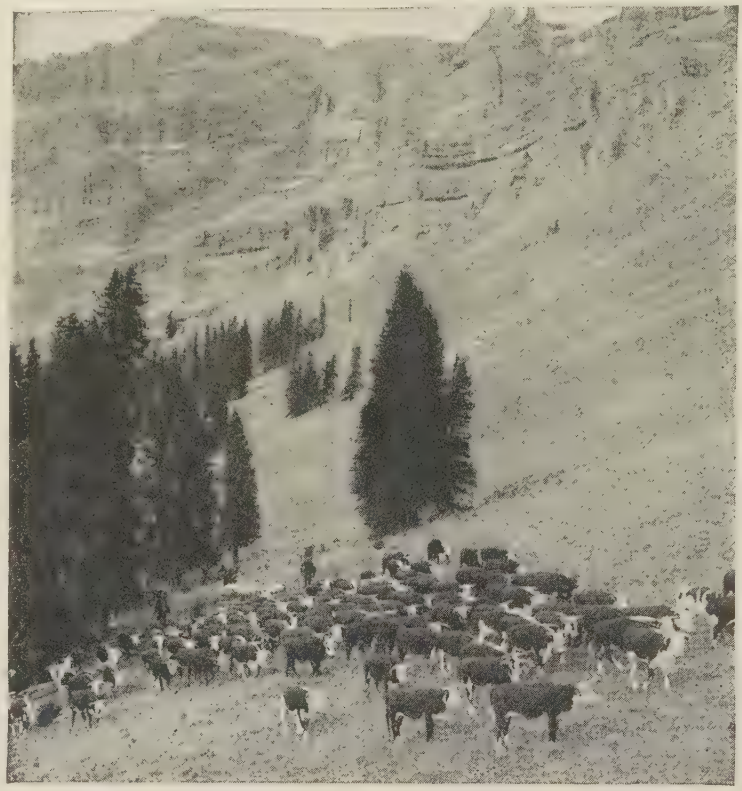
PROTECTED LAND MEANS WATER

Here, trees and forage will soak up the rain, prevent erosion and the clogging of vital reservoirs

U. S. FOREST SERVICE

the welfare of the nation. He believes that the states, as administrative units, can handle the watershed problems better than a bureaucratic government, once the ideals of conservation are developed by the federal government. But, like President Hoover, he is willing to accept the findings of the Commission and rely upon them.

His under-chiefs and those who know him have long called Doctor Wilbur "the High Priest of Conservation." They say, at the Department, that he talks the subject all of the time. And after listening to his emphatic phrases, one can realize that it is no mere empty title. When he talks of his beloved West and its land problems, his thin, large-boned face glows, his deep-set gray eyes brighten, the gestures of his prominent, nervous hands become rapid, sweeping,—his entire frame seems on the verge of motion.



U. S. FOREST SERVICE

HELPING TO MAKE AN AMERICAN DESERT

These animals, in too-great quantities, are stripping the West while the Government does nothing about it,—as yet

Already, after but a few months in the cabinet, he has a fine record of achievement. Within ten days after assuming office, he had opened a pathway for solution of the oil conservation problem, and had halted the mad race which was exhausting the great fuel reservoirs lying under the earth. He stopped the issuance of permits to prospect for oil on Government land, and withheld his signature from all oil leases except under extraordinary conditions. He helped to find a means to control drilling and eliminate waste in the oil industry. He suggested state agreements and his ideas are already in practical use in the Kettleman Hills oil fields.

He has paved a way for more efficient governmental handling of conservation affairs. The reindeer, for example, long the problem of the "school marms" of the Bureau of Education, follow all the other natural resources of Alaska, scattered over a dozen or twenty different bureaus, into the portfolio of the Governor of our most northern possession. He has suggested many other changes in government bureaus, eliminating inconsistencies and duplication of work. He is quite eagerly working for the alignment of the Forest Service with Reclamation, Lands and the Park Service, but frankly says that he cannot see ahead the day when the National Forests will be administered by the states.

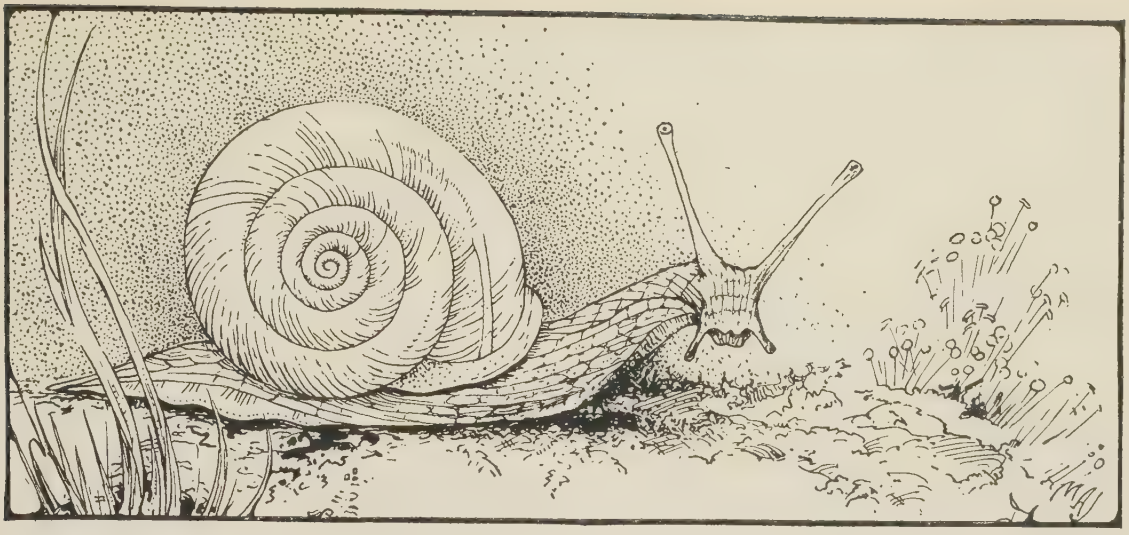
One of his pet ideas is the conservation of the desert. He wishes to keep the giant cactus, the mesquite, the yucca, the horned toad, and even the rattlesnake as a part of America's wild life. Perhaps one day,—who knows?—Science will find a use for them. In any event, they are part of the heritage of frontier days, and deserve ample representation in the great museum of the out-of-doors.

Secretary Wilbur is an "outdoor" man. It told in the expression of his tanned, weather-marked features, that afternoon, when he caressed with his fingers the hills and valleys on the map of his beloved California, where he had wandered through so many sunlit days. It is apparent during the summer months, when, as the President's companion, he travels up to the Rapidan to cook trout over a wood fire, and to roam the Virginia hills.

A lesser lover of the out-of-doors might not have been prepared to take his stand on the firing line in the public land controversy so soon after assuming office—only with a basis in first hand knowledge gained by tramping over the eroded hills could the situation be so clearly, vividly and romantically pictured to the people. A man with less idealism and imagination might not have dared to leap so far in the van of public opinion to voice an idea entirely revolutionary, unexpected and involving new precepts of government.

Perhaps his ideas are not the popular ones nor the ones that will be finally accepted. Perhaps they have made him enemies. But his vision of the West is a sure one, and his voice, crying as it were from the wilderness of ignorance, has startled the country to the verge of action—which is the biggest service of all. He has taken off the bandage from the eyes of the people, and made them realize they must solve a pressing problem. He has made them see—see the torn watersheds, the reservoirs filling with silt, and the herds destroying the forage; see the government standing still, while the Western cry for water rises strident from over the growing desert.

It takes a man to crank the governmental machine. It takes a fighter, a dreamer, and above all, a man with a sense of humor so necessary to reading withering telegrams. It takes a person with imagination and enthusiasm to run so far ahead of his day that he can gaze around the next turn in history. But Ray Lyman Wilbur, son of California's over-grazed plains and eroded gullies, doctor, college president, food conserver, believer in water, is such a man.



The Life of Nailie

A Little Snail Brings Happiness to a Home

by Muriel A. Jaisohn

She was on an oak leaf when I found her, taking a snail's-eye view of the great and towering wood, drowsy with the sleepiness of a winter just past and wet with the wetness of an early spring rain. She was a young though full grown Gastropod, one of the shelly land variety, and she was pale and lovely to look upon.

I picked her up to look more carefully at such an elfin creature, but the sudden action and touch frightened her and she drew very quickly into the innermost region of her shell, literally closing the door in my face, for, as I looked, only a glazed film was visible to show that the shell contained any life at all. So I put her gently into my pocket and took her home.

With a small wooden box for walls and floor of a home, fine wire for sky-light and fresh green moss for furnishings, the little snail took up a new life. "Nailie" became her name. For a day or two she sulked within her shell and any movement caused her to withdraw deeper and yet deeper into the spiral of her house.

Soon, however, a youthful appetite and feminine curiosity had to be satisfied. There was a slight motion of the shell, a little click, and first a tiny jaw cautiously appeared. Then an eye peeped out from beneath the protecting eave, and a tentacle was waved delicately around. These were followed gradually by the rest of her body and she gazed unhampered and unprotected on the new, foreign world. How strange and weird it must have seemed!

We were delighted. But alas! Our whispers and movements and the jarred box caused her again to slam her door in fright and from thenceforward we viewed her surreptitiously and at a distance. But snails, like people, cannot mope forever, and besides, she must have been very hungry. Nevertheless, she was wary. Daylight found her "Not at home", but the night, as it does all the eerie wild things of Nature, drew her out and around and around the box. I found her glistening tracks, made by a glutinous fluid to protect her fragile body, and traced them in a criss-cross of fascinating pattern.

But her food worried us. Of snail fare we were ignorant. By experimenting, however, we found her favorite dish. We put bits of apple, orange, carrot, lettuce and cabbage into the box and invited her to the cafeteria. She declined abruptly and indignantly, but morning found the tell-tale tracks all over the lunch counter. The carrot had been disdained, the apple sampled and cabbage likewise, but the lettuce had been eagerly devoured. Perverse woman!

From then on it was but a matter of time before Nailie became entirely accustomed to our voices, our faces, and our motions. She gave up popping into her shell in a rage, or pulling in her head haughtily when we moved the box. True, she did until the day of her death pull in one tentacle and point the other at us admonishingly if we annoyed her, but on the whole she became inured to

the life about her. We found her a delicate, gentle, little creature, a real personality, with decided intelligence, tastes, curiosity and insatiable appetite. She had the tiniest set of teeth ever one saw and her bites, for her, were enormous.

She swallowed her food upwards, rather than downwards, and this habit we deemed most curious. Through the transparency of her skin we could trace the lettuce from mouth to forehead, up over the head and into the nether regions back and beyond. Water she sipped daintily as it clung jewel-like to the moss.

My very greatest delight in the little snail was her trust and recognition of me from anyone else. I could handle and caress her and not a movement would she make, save to wave her tentacles sociably to and fro or explore my hand. But should anyone else pick her up—slam went the door!

So for over two happy years Nailie waxed and grew fat. They were uneventful years, save when once she escaped and I found her all wizened up on a curtain, dusty, weary, and her supply of protective fluid quite gone; or when the house needed redecorating and she moved during the installation of new moss; or when the house itself rotted altogether and she got a new one. Nor did she hibernate. The seasons found her very much alive and on the go.

Then on one morning, *the* morning, came the climax of her life. We found, piled in a corner, a little heap of pearls. They were Nailie's gift to us and to posterity. In due time, each pearl gave forth a tiniest snail, perfect and complete.

They cruised about the box for days and then, I know not why, one by one they died. Their little shells lay silently here and there like empty cradles. Their mother followed them soon after. She crept into a corner and stayed there, never to come out.

I kept her shell for a long, long time 'til it crumbled to a skeleton. But even that turned to dust and is gone.

AMID THE RIPPLES

By Toshio Asaeda. This brought $500 to the taker. At the right is Jack I. Pullen's picture, which took second prize in the Nature study class

THE NATION'S BEST PHOTOGRAPHS

Nature Winners in Eastman Competition

TOSHIO ASAEDA of New York City and Jack I. Pullen of Houston, Texas were the first and second prize winners in the Nature classification of the national amateur photographic contest recently conducted by the Eastman Kodak Company. Mr. Asaeda's subjects were the two geese, seen at the left, while Mr. Pullen chose the tree-frog, and collected $250, half as much as the first prize.

These were just the chosen two from a large field, and the judges must have had great difficulty in arriving at

a decision. The contest proved beyond doubt that hundreds of amateur photographers can equal professionals, and that Nature is "shot" as often as portrait, scenic or interior subjects. The grand prize winner was Lawrence L. Martin of New Orleans, who was given $2500 for his picture of Rosemary Martin, a daughter. More than three quarters of a million others competed. America is very camera-minded, and is becoming Nature-minded as well.

THE GOVERNMENT TURNS WATER FARMER
A general view of the Wytheville, Va., trout hatchery, nursery and bass ponds. Future years will see many more of these

Tilling Watered Acres

A New Type of Farmer Grows to Prominence

by Lewis Radcliffe

United States Bureau of Fisheries

In the springtime, while the urban dwellers' thoughts lightly turn to gardens or golf, the land farmer plans his crops and the water farmer eagerly devours the latest scientific papers dealing with the comparatively new science of aquiculture. He is in search of helpful suggestions to overcome the many difficulties which confront him in his efforts to make his water areas as productive as the same acreage of tillable land.

Water farmers?—you ask with arched eyebrows. Yes, there are numbers of them and you will be surprised at the rapid progress which has been made in this new field, and the eagerness with which it has been taken up. And if you will delve deep enough you may become enthusiastic over the possibilities of this science contributing materially to our annual food supply.

As a matter of fact, in the Orient the growing of fish for market on an extensive scale is an ancient industry. The writer spent a fortnight twenty years ago in and around Manila, P. I., during the typhoon season during which no sea fish could be gotten. Yet day after day he found the fish stalls in the great markets of the city piled high with a bright silvery fish—the milkfish,—reared in ponds close by. Without these fine fellows harvested from the tidal ponds, meat proteins would have been at such a premium that only a small percentage of the better class would have been able to satisfy their wants.

In the springtime you may discover individual fishermen armed with a small triangular cheesecloth net busily seining certain sandy beaches for the tiny milkfish but a few days old. The tiny fish are placed in earthenware pots and transported by swift sailing boats to the ponds. In some of the provinces the right to fish for the tiny fry is let to the highest bidder, one province deriving from $25,000 to $50,000 from this source alone. Under an intensive system of cultivating the vegetation upon which the milkfish feed, with the transferring of the fish to new ponds when the vegetation is no longer sufficient to keep them growing rapidly, these fishes grow to a marketable size by late autumn. In fact these rapidly-growing fishes may reach a length of twelve inches in four or five months after planting; sixteen inches in seven or eight months and eighteen inches before a year has passed.

The pond areas around Manila are valued at more than $10,000,000 and the annual harvest brings in more than $3,000,000. Among a people who depend so largely upon fish, pond culture is of great economic importance. The milkfish is also grown extensively in Formosa and Java. In the Hawaiian Islands are the celebrated mullet

THE FAIRPORT, IOWA STATION

One of the Bureau of Fisheries experimental laboratories, where it is proving the worth of tillable water acres

ponds, the time of building of some of which dates back into the age of fable. According to tradition, one of the ponds was built more than two hundred and seventy-five years ago and the natives engaged in its construction formed a line from the shore to the mountain and passed the lava rock from hand to hand till it reached the site of the pond without once touching the ground in transit. The ponds are formed principally in the bays indenting the shores of the islands, and are commonly constructed by walling off a section of the bay with lava rock. In 1900, these ponds embraced several thousand acres, valued at more than $165,000, yielding a harvest of 680,000 pounds. At the present time there are fifty-six ponds still in operation covering nearly twenty-five hundred acres and producing 150,000 pounds of mullet, which sells for an average price of thirty-five cents per pound.

In southeastern China, Dr. A. W. Herre advises the writer, there are innumerable thousands of fish ponds, chiefly devoted to growing carp. Many of these ponds are little more than puddles. In this region carp culture is the complement of silkworm culture, the land being devoted alternately to fish ponds and mulberry plantations. After about eight years, the pond is filled and used as a mulberry plantation, the excavated area being used as a fish pond. The sediment deposited in the bottom of the pond is cleaned out each year and spread over the fields as fertilizer. This method of farming has been in vogue for centuries. In handling the ponds, sound practice is intermingled with many superstitious observances and absurd customs. Some of the fast-growing species of carp are so highly appreciated that there is a considerable export trade of the young to Formosa, Singapore, the federated Malay states, and to other parts of China for stocking purposes.

MASTER OF AN OLD SCIENCE

Here is a Filipino with his net for catching milkfish fry, one of the products of an old industry

Fresh water pond culture is also practiced in Java, the best and most important fish being the gurami. This species builds nests in which to lay the eggs. Careful breeders, Doctor Herre writes me, place nests in shallow waters near the edge of the pond for the use of the gurami. When discovered, the eggs are removed and placed in a large wide earthenware pot of water which is placed in the pond to float in the shade. The newly-hatched fry are held in these pots for about two weeks and then transferred to a small, specially-prepared pond and held for two or three months before transferring them to the large growing ponds. The people owning gurami ponds are the wealthiest and most progressive people of their neighborhoods, and the fish ponds' areas bring the highest real estate prices of the region. The gurami of Java and some of the fast growing carps of southeastern China merit the attention of aquiculturists in other parts of the world.

Aquiculture has reached an unusually high state of perfection in Japan. No less than one hundred thousand establishments are engaged in the practice in public waters, and the areas under cultivation amount to some 165,000 acres, yielding products to the value of $9,000,000 annually. Carp, trout, eels, mullet, turtles, oysters, mussels, and other species are raised. The number of establishments carrying on water farming in privately-owned waters also exceeds one hundred thousand.

Carp, grown in rice fields, ponds, lakes, and marshes, and eels, salmon, mullet and goldfish, are the principal yields. Privately-owned waters used for aquicultural pursuits exceed 36,000 acres and the annual harvest is valued at more than $3,000,000, making the total value of aquicultural crops $12,000,000 a year.

While water farming in many Oriental countries yields a very considerable crop, the methods, excepting in Japan, are for the most part empirical, handed down from one generation to the next, and the fundamental principles underlying their success are but little known. Their practices are therefore of little significance to the embryo water farmer who wishes to embark in this field. The entrant into this new field wants to know what to do, why he should follow a particular course of action, what difficulties are to be avoided, and, in fact, the things he should do to obtain a yield as great or greater than from an equal land area.

It is true that fish culture as practiced on a huge scale by federal and state agencies is a phase of aquiculture. In the past, chief interest in this field has centered in the mechanics of operation,—in hatching out an ever increasing number of billions of fry and planting them as speedily as possible, trusting that a sufficient number would survive and grow to maturity to justify the expenditures. Within the last decade, in particular, workers here and there have become dissatisfied with such methods and have begun to delve deeper to ascertain the results achieved under the present system and to readjust practices to yield a much greater return of adult fish. They plan a sort of intensive cultivation.

Such men as C. O. Hayford in New Jersey, N. R. Buller in Pennsylvania, John W. Titcomb in Connecticut, and Dr. G. C. Embody at Cornell have become critical of former practices and have initiated investigations to help solve the problems with which they were confronted. Under the fostering guidance of Commissioner Henry O'Malley, the U. S. Bureau of Fisheries has rapidly expanded its program of research, not only in the field of fish culture but in other branches of aquiculture such as oyster farming, terrapin culture, the development of a program of fresh water mussel farming and the scientific management of water areas such as those in the Mississippi Wild Life and Fish Refuge area along the upper Mississippi River.

The Bureau's Pittsford, Vermont, hatchery is devoted to the problems of trout culture,—such as feeds, selective breeding, study of diseases. At the Fairport, Iowa, Biological station, similar experiments are being made with warm water species—bass, bluegill and crappie. Here carefully planned studies in pond fertilization, in the introduction of forage fishes for the basses to feed on, and the growing of plankton, and in other fields are steadily raising the productivity of water areas to a point scarcely dreamed of a few years ago.

On the Atlantic and Pacific coasts a staff of highly trained scientific workers are directly aiding the oyster

When Lewis Radcliffe, the author of this article, writes on fishes, he writes as an expert and an authority. Ever since he graduated from Cornell in 1905, his reputation in this field has been growing. He was a member of the famous Albatross *expedition to the Philippines in 1907, Director of the U. S. Fisheries station at Beaufort, N. C., a Chief of the Division of Fisheries Industries in the Bureau of Fisheries, and is now Deputy Commissioner. He has made studies of fish-life in Chesapeake Bay which have proved invaluable in conservation work there. In recent years, he has given particular attention to the development of oyster farming and aquiculture, and is foremost in the development of these newer fields.*

WHERE THE GAME BASS GROWS

At this Orangeburg, S. C., water farm, many a fisherman's catch grows to maturity, later to be placed in ponds

farmers to overcome their difficulties and increase their yields and are mapping out a program whereby the state authorities may properly maintain the natural supply.

At the Beaufort, N. C., biological station the practicability of growing the diamond back terrapin—the delight of the epicure—has been advanced to the stage of consideration by the water farmer, and in cooperation with the North Carolina state authorities, thousands of young terrapins are being reared for stocking the waters of the state.

These activities illustrate the measure of attention aquiculture is receiving from the U. S. Bureau of Fisheries, and are developing so rapidly that it is most difficult to find college graduates with the necessary basic training for conducting investigations in this field. The few universities that specialize in this branch have little difficulty in placing their men in positions where they may continue their scientific studies.

In practice we find many lines of water farming. Perhaps the most highly developed is that of oyster farming, centering in the Long Island Sound region where cultivated areas have largely supplanted natural grounds. This is also true of points on the coast of Washington, Olympia oysters being famous on the west coast. With the development of oyster farming to an exact science, we may expect that it will largely supplant natural producing areas and supply an annual harvest several times greater than the present yield. Already some attention is being given to the practicability of clam culture and the growing of scallops.

The raising of goldfish is an important industry in the United States; goldfish farms exist today in Maryland, West Virginia, New Jersey, Indiana and California. Trout farming is still another phase of aquiculture. The demand for the eggs for stocking public and private waters is sufficient to attract considerable investment in the venture, annual sales of trout eggs being estimated at about $200,000 annually. In addition, surplus fish are sold for food at fancy prices.

Many other illustrations will come to the mind of the reader such as muskrat farming, growing fish in farm ponds and probably frog farming. Of the last mentioned, not infrequently the principal source of revenue has been the passing along of the alleged secrets of success for a consideration. It appears that even in this field one may develop means of supplementing natural conditions so as to increase the productivity of a given area. Recent exports of several thousand adult bullfrogs to Japan for breeding purposes reveal the interest of the Japanese in the possibilities of frog farming in a land where, like our own, frog legs are listed with other epicurean delicacies.

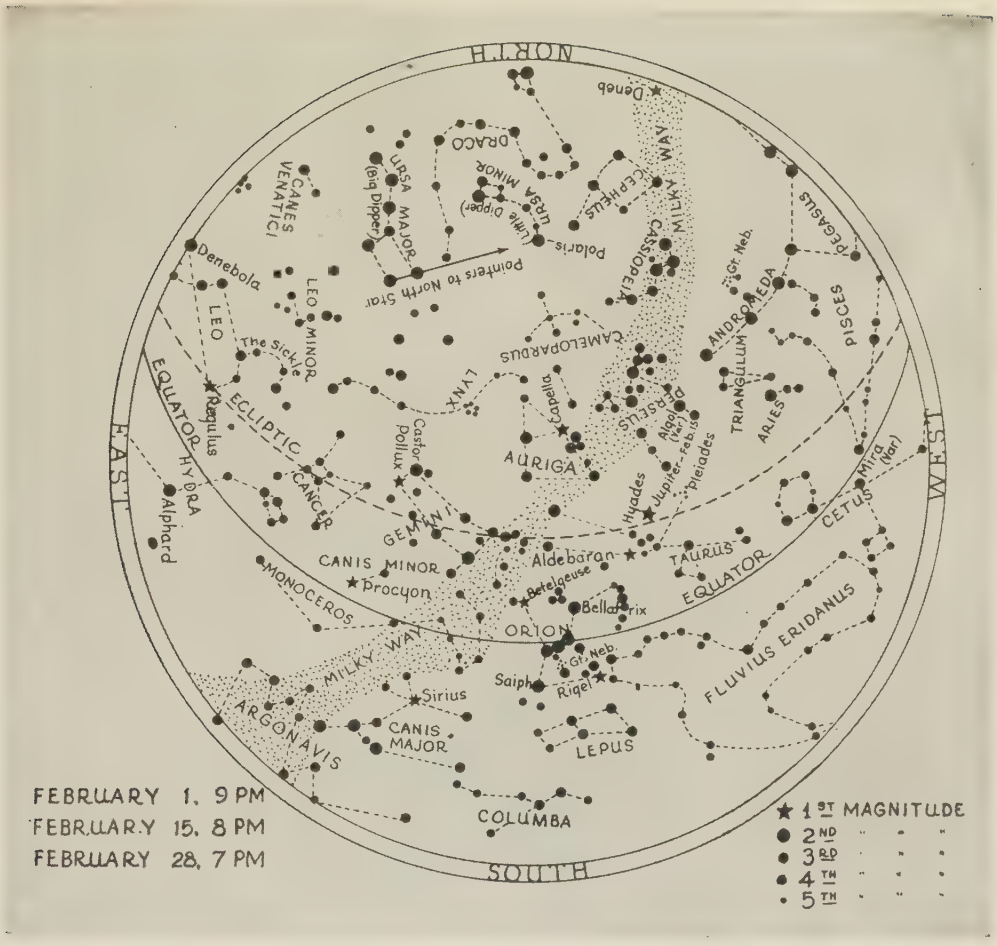
Naturally one of the first questions that will come to the mind of the embryo water farmer will be a comparison of the productivity of land and water areas of the same size. There is considerable evidence at hand that water areas will produce more food than the same acreage of tillable land, and that, as this new science advances, we may obtain an annual harvest far greater than any similar land area can produce. As a result of considerable study, Dr. G. C. Embody of Cornell University concludes that our richest trout streams should produce three hundred pounds of trout flesh per acre and our poorest streams about seventy-five pounds. He cites the case of an eastern private trout stream, having a width of about fifteen feet, very rich in food, and heavily stocked, which has yielded from about five hundred to seven hundred legal sized trout per mile per annum.

At the Bureau's Fairport station, where experimental investigations are being conducted under the direction of Dr. H. S. Davis, one of its ponds produced the equivalent of 272 pounds of bluegill sunfish per acre in one summer, and another 450 pounds of goldfish, and the maximum production of 3-inch bass in a season has been raised from 6,200 to 11,500 per acre. At the present time the huge acreage of oyster bottoms along our Atlantic seaboard yield one hundred pounds of oyster meats per acre annually. Under a proper system of intensive oyster farming it is conceivable that we may easily double or treble the production per unit area.

These are but glimpses into this newer science of aquiculture. In the course of its development there will be many failures, many difficulties to overcome, but with their solution we shall in time fix more definitely the productivity of water areas and the place of aquiculture in supplementing our meat protein supply.

In previous issues of NATURE MAGAZINE *Edward A. Preble has written notable articles on fur-bearing animals and on hawks from the conservation point of view. These were reprinted as booklets and have been widely used in educational work. A few of these booklets, incidentally, are still available in lots of ten or more at a cost price of five cents each. They are illustrated in color.*

In the March issue Mr. Preble will add to these two significant articles a third on the owls of the United States, their importance as subjects of legend and folklore, their life habits and, in many instances, their economic value.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

How the CELESTIAL SCENERY SHIFTS

Constellations Slowly Change in Form as the Stars Move Onward

by Isabel M. Lewis

CENTURIES ago, when man first began to study the stars, he grouped them into fanciful forms of animals or objects familiar to him. He pictured, upon the inverted dome of the night sky, serpents and dragons; lions and dogs; heroes and maidens; crowns and harps and triangles; a sky-river, a fabled ship and strange creatures of the sea; a sea-goat, a dolphin and a whale, tracing their more or less crude outlines with the aid of the brighter stars. On through the centuries man has added to these celestial forms and filled in gaps that existed in celestial regions of the southern hemisphere, less widely known, with such forms as a crane, a peacock, a gold-fish and a flying-fish, bearing little if any resemblance to the creatures for which they were named, until now all the stars in the heavens lie within the boundaries of one or another of ninety different constellations.

With a few exceptions, due to the more rapidly-moving stars, the constellations appear today to unaided vision in the same relative positions that they did five thousand years ago. With respect to other constellations and in their individual forms they are practically unchanged.

The Precession of the Equinoxes, which is the slow westward shift of the points of intersection of celestial equator and ecliptic, has produced a slow conical revolution of the north pole of the heavens around the north pole of the ecliptic in a period of 26,000 years. This has brought about great changes in the appearance of the

heavens in any one latitude in the course of centuries though it has left the relative positions of the stars and constellations unchanged.

Five thousand or six thousand years ago Alpha Draconis was the pole-star and The Southern Cross was visible in the latitude of London. In the year 8,000 A. D. Alpha Cephei will be the North Star, and in 14,000 A. D., the magnificent Vega will have that position. Once more, 26,000 years from now, Polaris will take its place as the Pole-star. During this period of 26,000 years in which the north pole is completing one revolution around the north pole of the ecliptic, the vernal equinox will have backed completely around the heavens through the zodiacal constellations and returned to its present position in Pisces. The sun will have appeared in turn in each one of the zodiacal constellations at the beginning of spring. This will bring into view for centuries at a time constellations that are now always below the southern horizon and will completely change the appearance of the circumpolar heavens as well, although the form of the constellations will remain unchanged for several thousand years to come. Precession shifts the celestial scenery as a whole in any one latitude without changing necessarily the appearance of the various actors, the constellations.

This conical motion of the earth's axis about a fixed line directed toward the pole of the ecliptic and the westward shift of the points of intersection of equator and ecliptic, known as the equinoxes, are due to the fact that the earth is not a perfect sphere but has an equatorial bulge which the gravitational attraction of sun and moon, working together, tends to draw into the plane of the ecliptic. The behavior of the earth's axis of rotation, as a result of this attraction, is very similar to that of a spinning top. The force which tends to change the direction of the rotating body produces a motion at right angles to its own direction and a conical motion of the axis of rotation is the result.

Although the Precession of the Equinoxes does not alter the positions of the constellations with respect to one another nor change the form of the individual groups, it is true that the forms of the constellations are slowly but surely changing. Every star in the universe is in motion. There are two components of a star's motion that astronomers measure, one the "proper motion" of the star, that is its motion *across* the line of sight, and the other the radial velocity or motion *in* the line of sight toward or away from the observer. This is determined for stars of sufficent brightness by observing and measuring the shift in the lines of the spectrum of the star. When these two components of the star's motion are known its actual motion through space relative to the earth can be determined. The sun, also, as one of the stars, is moving onward through space in the general direction of the bright star Vega at the rate of twelve and a half miles a second. In the course of centuries, slow as these motions are compared with the enormous distances that the stars travel, they are bound to be reflected in the positions of the stars relative to one another and therefore in the form of the constellations. Sooner or later the fanciful forms that star-gazers of the distant past pictured in the sky will fade away and others will take their place. Our Big Dipper will lose its characteristic form in less than fifty thousand years and will need to be renamed. Five of its stars belong to a great moving cluster of stars known as the Ursa Major group and they are moving in parallel directions through space, but the other two stars, the one at the end of the handle and the more northerly of the two stars known as The Pointers, are moving in other directions and the effect will be to destroy eventually the form of this historic configuration.

That beautiful little group known as Corona Borealis, The Northern Crown, is also doomed to lose its distinctive form in twenty thousand years or less. Scorpio, one of the most striking groups in the sky, belongs to a great group of stars known as the Scorpio-Centaurus group. Some of the brightest stars are members of this group, including Spica and Beta Centauri, as well as Antares and stars in the Southern Cross. Its stars are comparatively far away and their individual motions across the sky in a century are very small. But in fifty thousand years the tail of the Scorpion will be no longer recognizable.

The great constellation of Orion is formed of stars that, with the exception of ruddy Betelgeuze, belong to an enormous cluster that is at a distance of over six hundred light years from the earth. This group is moving directly away from the solar system so that the motions of the individual stars are very small, and, as a result, the form of the huge sky-warrior will remain unchanged long after nearer groups have lost their distinctive forms.

For the next five thousand years or so few changes will be noted in the forms of the constellations. Then, gradually, the effects of the motion of the stars and the sun through space will become increasingly apparent, and the astronomers of far distant ages will undertake the task of mapping out new constellations with new boundaries in the heavens above and will bestow upon them strange names, including, possibly, the names of objects unknown to the present age.

Jupiter is now a fine object in the evening sky in Taurus. On February 26 it will be on the meridian due south at sunset. Venus will not be visible this month as it comes into superior conjunction with the sun on the sixth of the month. It will next be visible low in the west in the evening twilight. Mercury will be at its greatest elongation west of the sun on February 15, and may be seen for a week or so before and after this date in the southeast just before sunrise. Mars is now in Capricornus and still too close to the sun to be seen. It is far from the earth and no brighter than a star of second magnitude. Saturn is in Sagittarius and is visible in the southeastern sky before sunrise.

This is a particularly good time to observe the magnificent constellation of Orion, considered to be the finest constellation in the heavens. To the northeast of Orion is Canis Minor which contains the Little Dog-star, Procyon.

Castor and Pollux in the constellation of Gemini are now high in the eastern sky and northwest of Gemini and north of Orion are Capella, the She-goat, and her three Kids in a little group to the southwest, which Auriga, the Charioteer, holds in his arms. The Milky Way is particularly beautiful at this time of year arching high across the heavens from Gemini through Auriga to Perseus and Cassiopeia.

SNAKE BIRDS

Throwbacks to a Reptilian Heritage

by W. L. McAtee

SCIENTISTS agree that a long way back birds and reptiles were closely placed branches on Nature's family tree. Nowadays, however, one rarely thinks "snake" in connection with a bird, especially if it be one of the soft-plumaged, sweet-voiced, small and inoffensive kinds with which we are most familiar. Occasionally one may get a glimpse of the unblinking bead-like eye of a bird brooding in some dark shelter, that gives a distinctly "snaky" impression, and it must be recorded that there is enough suggestiveness of snakes about birds so that for one reason or another quite a large number of them have been named "Snake Birds."

The European wry-neck is one that goes the limit in snakiness. Having as it sits in its nesting cavity the fixed stare previously alluded to, it indulges also in tortuous movements of the neck which account for the name wry-neck mostly used in books,—and it hisses. These features combined have firmly convinced lay observers that it should be called snake-bird, and such is its cognomen in the English country-side.

In America we also have a bird whose generous length of neck, and the movements thereof have given it the name of snake-bird. This is the Anhinga or darter of books and as one sees it in southern cypress-swamps often protruding only its head and long neck above the surface of the water one re-christens it with the popular, and fails to recall the book, name.

The cypress-swamp snake-bird really has some bodily resemblance to a serpent to justify its nickname, but one of our small land birds gets the name solely from its appearance in motion. This is the lark sparrow which in Utah is known as snake-bird from its running through the grass "like a streak". The name, could, with equal reason, be applied to a variety of small ground birds, including several kinds of sparrows.

The birds so far mentioned agree in having something in their appearance or actions to suggest the snake, while we have another that is dubbed snake-bird or snake-skin bird because of its taste in interior decorating. The great crested flycatcher has the peculiar habit of always draping one or more partial or even entire shed skins of snakes over its nest. The nest is invariably in a cavity where visibility is poor so that a reason for the snake-skin decoration is difficult to surmise.

AFRICA'S SECRETARY BIRD

Like our roadrunner, he is associated by name with reptiles having the title of snake bird

A number of groups of birds throughout the world have been given the title of snake-birds because they eat snakes. A whole group of tropical hawks go by the vernacular name of snake hawks or snake buzzards, and the former name has been applied to our beautiful and graceful, but now regrettably rare swallow-tailed kite. The snake crane, alias the crested screamer, of Brazil also gets its reptilian appellation from its fondness for snakes as food. The well-known secretary-bird of Africa is called snake-eater or snake-bird, and our curious road-runner, a kind of cuckoo which lives on the ground and can keep pace with a running horse for a short distance, has among its long list of local names that of snake-killer.

Of all the reasons, however, for calling birds snake-birds, the most remarkable is that of the old negro mammy in Virginia, who so called the catbird, "coz he chases de snakes away." And perhaps the creature does.

THE DECOY

An Old Stump Imitates A Bird

Out in a field near Owensboro, Kentucky, stands this grotesque caricature of a bird or water fowl on the nest. Even the eye seems to be in place, for a hole letting through daylight, well imitates the sight organ of some bird. The object is nothing but an old stump, worn with age, but so realistic is it that many people are completely fooled when seeing it from a distance. Henry S. Barton, who sent the photograph, does not reveal, however, whether hunters pop at it by mistake, or hide by it to watch for other birds who are decoyed by this queer object. In any event, before many years pass, it may, provided the weather does not destroy it, stand as a monument for departed legions who no longer roam the land.

A RARE PLANT FROM THE FAR EAST

The Sacred Lily Of India

by Pearl K. Leonard

SUMMER AND WINTER

The bulb at the left in the lawn in summer and at the right it grows from the bulb with no earth or water

THE SACRED Lily of India, *Amorphophallus rivieri,* has its appeal for gardener, botanist, and Nature lover. It is a newly-introduced bulbous plant, until very recently not readily procurable, blooming in the house in February from a dry bulb.

The bulb, the blooming size of which must be at least four years old, is necessarily large, for the magnificent flower which grows from it—without earth or moisture—is usually seven feet or more tall. The blossom itself is three feet long, a combination of deep maroons and reds, borne on a slender green stem which is mottled with white. It is extremely difficult to convey to minds that usually think in terms of relatively small flowers the stateliness and elegance of this bloom. Can you imagine a giant red calla lily, with the spadix lengthened and broadened to immense proportions, rearing itself higher than a man's head? If you can, you have an idea of what the Sacred Lily is.

The most astonishing feature of this bloom is that all the bulb requires is a little warmth. Absolutely no earth or water is needed to aid its flowering, and a bulb four or more years old will bloom every year. When the flower stem starts in February, the growth is amazingly rapid, sometimes increasing as much as four to six inches in a single day, and attaining its maximum growth after about thirty days.

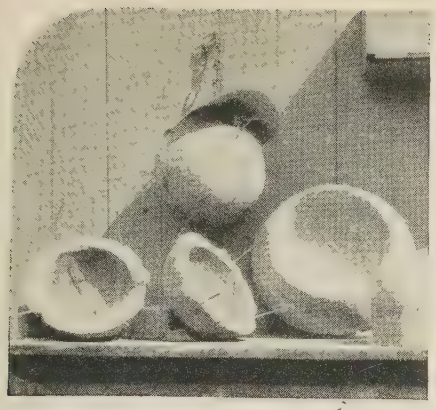
Of course, the bulb cannot bloom year after year without renewing its energies, so in late April or May it should be planted in the yard or garden. All the care it requires is a little loosening of the earth about it, and to be kept moist in dry weather.

The plant of the Sacred Lily in the summer is very attractive, growing about four or five feet tall from a blooming size bulb, and reaching its full growth in about a month after planting. Its stem is slim and straight, green mottled with white, and crowned with a spreading palm-like arrangement of branches, the leaves of which are small, green, and edged with a dainty lacy effect. If the bulb produced no flower at all, the plant would be enough to warrant its keep, for its graceful, exotic foliage lends a foreign touch to any garden that is decidedly fascinating.

After the first hard frost the plant will dry and wither and the bulb must be taken up before freezing weather. When the bulbs are dug, offshoots may be found. These should be planted the next spring for additional bulbs. Young bulbs will produce foliage each year, but will not bloom until the fourth year.

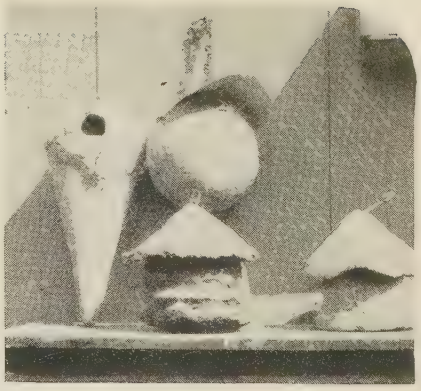
The Sacred Lily is such a rarity and so unusual that it never fails to attract attention. When its ability to bloom without food or drink and its beauty and size are considered, it is not difficult to credit the report that the natives of India worship it. This belief is widespread and apparently well founded enough to give authenticity to its name, "Sacred Lily of India," although it appears occasionally under such colloquial names as "Devil's Tongue," "Snake Lily," and "Giant African Lily."

Among the many interesting features scheduled for use in the March issue of Nature Magazine is a notable story on the Rain Quail of India. Dan MacCowan writes entertainingly of the amusing and prankish pack rat. Hawaiian birds, some beautiful snakes, trees, Spanish moss and some diseases of garden plants provide the subject matter of other excellent articles for March. The charm and beauties of Jasper National Park, Canada, will be the subject of a special feature.



HOMES IN CEMENT

by David T. Marshall



"BUILD FOR PERMANENCE." This is the slogan of many a realtor, and the same axiom can be applied with ease to avian homes made of cement. Nor will there be any difficulty in renting—birds, like humans, flock to the latest developments.

For those not wearing a masons' union button, the task of working in such a medium may seem too difficult, but after an apprenticeship which consists of reading these directions, full mastery of the art is obtained.

Form a ball of clay, or mixture of clay and sand, about six inches in diameter; then hollow out a hemispherical depression in the earth or in a box of moist sand about eight inches in diameter. Fill the depression with a mixture of two parts sand and one of cement with enough water to make a stiff mush. The ball of clay goes in the center of the cement and is depressed until it is within an inch of the bottom. A small pebble will serve to prevent the ball from sinking to the bottom. Once the core is in place, the cement is built up around it, with moist sand packed close to give support. A big cork is placed in the top, to become the entrance hole in the model home, and a stout wire, sunk in the cement, forms the hanger. Some non-rusting wire is advisable, as rust will discolor the home, ruining its appearance.

The clay core can be softened in water, and cleaned out with a wire when the structure is hard. It may be advisable to make a visor of cement or of galvanized iron to fasten above the hole. The product may be painted with a mixture of water, paint and cement to give the desired effect.

If a number of houses are to be built, a cement mould, hemispherical in shape, can be made. This serves to form each half of the house, and wires, placed in the cement, will fasten the two halves together.

Anything that will give even temporary support to cement may serve as a form,—tin pails, wooden boxes, and even a roller bandage of burlap. Piling sand against the hardening product gives a rough surface which is very desirable and artistic.

Among the many cores that may be used, one of the easiest to remove is twine. Wind a ball of it around a stick somewhat longer in length than the house is to be wide. When the cement is dry, it is necessary only to pull out the stick and the void will act as an entrance. It is advisable to wrap several layers of paper around the stick, as otherwise the cord may stick when wet.

Simple, is it not? But watch out the building trades do not get after you. You're breaking all the rules.

This is the time of year to be thinking about what provisions you are going to make for bird visitors in the spring and planning the sort of habitations you are to provide for them during the nesting season. Bird houses are not haphazard things but should be considered with care and a view to the sort of birds you wish to attract. Excellent, scientifically designed bird houses are available from several manufacturers if you wish to save the trouble of building the homes yourself.

THINGS to THINK ABOUT

A Page Devoted to Conservation from Varying Angles

More About Roadsides

Reports from various fronts in the battle to reclaim and preserve our roadside beauties are constantly being received by the American Nature Association.

One of the most interesting developments is the inauguration of a demonstration state survey by the National Council for the Protection of Roadsides. This is the new name of the organization previously known as the National Committee for the Restriction of Outdoor Advertising, through which more than one hundred organizations joined to work in this common effort. The survey is being conducted by virtue of the support of the American Nature Association and is in the charge of Mrs. W. L. Lawton.

North Carolina has been selected as the state for the survey, particularly on account of the progressive attitude of the highway department of the State, which has been doing effective work in roadside planting and beautification. The survey will be thorough and cover the entire state. Each highway of importance will be covered, mile by mile, and extensively photographed. A complete consideration will be given to the various phases of North Carolina's particular problem and a full report with recommendations will be made and published as a part of the demonstration. At least two months will be devoted to the study.

Partial surveys have been made in New Jersey and in Virginia, to be more completely followed out later. The American Nature Association feels that the entire problem should be approached on a practical basis, and that whatever is proposed should be founded upon irrefutable facts carefully gathered and considered.

The article on California's billboard problem in Nature Magazine has brought some surprisingly interesting reactions and many letters of commendation from citizens who resent the desecration of the landscape of their beautiful state. A conference at Sacramento recently resulted in the adoption of a militant program. Action has been taken to band together property owners along the approaches to Yosemite National Park to remove all billboards on this approach. The City of Pasadena, recently adversely advertised by pictures of contiguous signboards, is aroused to action. The Hollywood Plaza Hotel, one of whose signs we showed in our article, write that they have stopped this sort of advertising but point out that the boards they used still stand,—blank. The yeast of public sentiment is working.

CALLS HER SCENERY EUROPE'S GREATEST ASSET
DILLMAN HITS AT ROADSIDE SIGN HORRORS
BILLBOARDS SAID TO BE SCENIC MENACE
STATE HEARS PLAN OF FIGHT ON BILLBOARDS
SHOWS EVILS OF OUTDOOR SIGNBOARD
Hatchet Squads Open Sign War in Westchester
BILLBOARDS OF PARK FOUGHT
MRS. W. L. LAWTON

PUBLIC OPINION EXPRESSES ITSELF

A few of the newspaper clippings about the billboard problem surround Mrs. Lawton, who is in charge of the demonstration survey in the South

---

Bag Limits on Mourning Doves

The plea is often made that no bird that lays but four eggs at a time ought to be on the game list, the group referred to being the shorebirds, including the avocet, godwits, curlews, plovers, snipe and woodcock, as well as the small sandpipers. This seems reasonable, but what shall one say of the pigeons and doves, that lay only two eggs? Yet a hunter may kill mourning doves, in most of the states that allow their shooting, to the number of twenty-five each day, being the product of twelve nests. A number of states, including Missouri, Nevada, Oklahoma, and Virginia, allow the sportsman to try to kill his limit each day for 106 days each fall. A few states are less liberal, allowing only fifteen or twenty birds each day of the open season, and Minnesota, one of the few northern states that permit this bird to be killed as game, allows only nine per day for a short season.

Is it any wonder that many thoughtful persons, even some sportsmen, predict for the mourning dove the fate of the extinct passenger pigeon? We do not agree with this view, for we believe that before this fate actually threatens, its outraged friends will demand the removal of this gentle, harmless species from the game list.

The truth is that in most of our states the bulk of the upland game species are so reduced that it is difficult to find anything sizable to shoot at, and the hunters hate to give up the dove.

Alaska Caribou Suffer

We note that under the game laws in force during the season 1929-1930, the killing of caribou in Alaska, north of the Arctic Circle, is permitted the year round. This seems to be a decided backward step, and one decidedly out of harmony with the custom in the neighboring provinces of Yukon and Northwest Territories, where the conditions are very similar, and where the tendency is to restrict, rather than extend seasons for killing big game species. In these provinces the killing of female caribou with young (in Yukon females at any time) is prohibited. Yet in northern Alaska anyone may now lawfully kill mother caribou with their helpless young throughout the summer.

It has long been customary to extend to natives and explorers in the remote parts of Alaska, as well as in the northern provinces of Canada, special hunting privileges, in recognition of the fact that they are largely dependent on game for subsistence. But the privilege just cited, open to everyone, seems scarcely justified by any reasonable considerations.

Helps and Hints

FOR HOME AND GARDEN

PLANTING THE GARDEN, MONTH BY MONTH

By Romaine B. Ware

He who truly appreciates Nature's wonders and studies them through the medium of a flower garden, is keenly alive at this season. Seed catalogues, countless thousands of them, shout advance notices that the perennial crop of seeds is ready. The catalogues vie with each other in presenting novelties and new things and we plant mental gardens upon a grand scale. With seeds as a basis for mixing our pigments we vision garden pictures more perfect than ever before, because gardening is a creative art, one in which true individuality may be expressed. The opportunity is before us, the seeds will do their part if we will do ours, but we should not blame it to poor seeds if we neglect to supply the requisite conditions and care. A very large part of success with seeds depends upon one's knowledge of the fundamental rules.

Garden planting at this season of the year, except in the extreme south and upon the west coast, is largely confined to seeds that must be started indoors. A few weeks later hot-beds may be started and later still cold-frames can be planted. The starting of seeds indoors is comparatively simple if a few general practices, developed by countless thousands of home gardeners, are observed.

First, buy good seeds from reliable established seedsmen. They use every precaution to supply only the finest and freshest seeds. Go over the catalogues, several of them, compare, select and re-select with the greatest care. Include the old standbys together with some of the highly praised novelties. Start more plants than you expect to use. They always come in handy to fill blank spaces or to trade with a neighbor for things you do not have. Unless you need an extremely large number of plants of any one variety, a single packet of each is usually sufficient. Such things as petunia, verbena, vinca, pentstemon, lobelia and snapdragon should all be sown before the end of February. Some of them are very slow in germinating while others develop slowly and need many weeks to attain blooming size.

Planting seeds indoors necessitates careful attention to soil, containers, watering, sunlight and ventilation. Seeds will germinate in pure sand, but a mixture of sand and leaf mold, half and half, will give better results. When the seedlings have their first true leaves, transplant them into soil made by mixing and sifting through a quarter inch mesh sieve, sand, leaf mold and good garden loam, about equal quantities of each. No fertilizer is needed at this stage of their growth, but special attention must be given to proper drainage.

DEPENDABLE—*that's what our plants are*

In the first place, every one of our Rockery Plants and other Hardy Plants is two years old. None of them are greenhouse coddled. Every one is field grown. In fact, no one the country over, produces such great quantities of field grown stock. The clumps we ship are unusually large full rooted ones.

As for packing, doubt if any one takes quite the pains we do. Because of it, our plants are shipped from coast to coast and invariably come smiling out of their packing. Besides, we guarantee arrival in good condition. A guarantee meaning exactly what it says.

The new catalog is now ready. Rockery Plants should be set out as early as possible. So send at once for catalog and get your order in early.

Reg. U.S. Pat. Off.

E. H. Schultz, *Pres.* **Wayside Gardens** J. J. Grullemans, *Sec'y-Treas*

MENTOR, OHIO

A Fall-Blooming Tree Of Unmatched Charm

White as winter's snows, a center of golden stamens, and a delicate fragrance, the blooms of Franklinia (Gordonia) are matchless in loveliness.

The flowers, about 3 inches across, open in mid-August and are produced continuously until frost. The tree is hardy, in protected situations, as far north as Boston, growing readily where rhododendrons thrive.

Extra heavy plants, 27 to 33 inches high, $7.50 each Splendid specimens, 18 to 24 in. high, $5 each, 10 plants for $45.

Orders should be placed at once for spring shipping. Further description and details on request.

WHITESBOG BLUEBERRY NURSERIES
Joseph J. White, Inc., Whitesbog, New Jersey

Dreer's Garden Book

"I ALWAYS go to Dreer's" is the explanation you invariably get when you admire a neighbor's garden. Why not insure your own success with Flowers and Vegetables by selecting them from our 1930 Garden Book?

A copy free if you mention Nature Magazine

HENRY A. DREER
1306 Spring Garden St.
Philadelphia, Pa.

SEEDS Grown by a Woman

Everybody is delighted with my New Early June Asters. Biggest earliest and best. Continuous bloomers.

For 10c I will send liberal packages white, pink, lavender, crimson and purple. No better seeds grown.

Guaranteed to Please

Order today send 10c to help pay postage and packing and receive the **5 new varieties of asters** and my bargain Seed Book.

Charlotte M. Haines
Dept. 824 Rockford, Ill.

MAULE'S SEED BOOK *free*

Pedigreed by a 53 year record of Super-Quality, tested for abundant life, guaranteed by a money back bond, Maule Seeds are outstandingly desirable. Send for Maule's FREE Seed Book today, and learn how to have a gorgeous garden at *low cost.*

WM. HENRY MAULE
430 Maule Bldg., Philadelphia, Pa.

PLAN YOUR GARDEN WITH NATURE MAGAZINE

Beauty that is a joy forever

YOUR home. Can't you imagine the added beauty and value it would possess with an appropriate setting of Evergreens? Rare charm, indeed; and with the passing of the years it becomes still more beautiful and valuable. That's the secret of Evergreen popularity.

Hill's Evergreen catalog for 1930 is now ready. By far the most comprehensive ever produced, it contains a rich fund of useful Evergreen information—with 50 illustrations in full colors.

HILL'S EVERGREENS

In choosing Hill's Evergreens for foundation planting, or as a colorful screen or garden setting, you choose wisely. For here at Hill's, in our 600-acre nursery, we grow nothing but Evergreens—and this we have been doing for the past 75 years! In writing for our 1930 book enclose 25c (coins or stamps), which will be refunded on any order you send us.

D. HILL NURSERY CO.
EVERGREEN SPECIALISTS
LARGEST GROWERS IN AMERICA BOX 297 • DUNDEE, ILL.

The Most Convenient of SEED & PLANT BOOKS~

Write For Your Copy Today!

Prepared particularly for home gardeners. Flower and Vegetable Seeds, rare and common, that will thrive under least experienced care. Profusely illustrated in natural colors. Read so easily selection is pleasant recreation rather than a confusing task. Every item carefully selected for quality, hardiness and yield by a group of America's foremost seedsmen. Inferior varieties find no place in this book. Only kinds you can depend upon.

You'll be interested in our new Bright pink Ruffled Petunia; Hardy Double Carnations in five colors; a new fragrant Sweet Pea; New Asters; New Zinnias; New Vegetables. We've printed the sort of seed book you've always wanted. Send for it to-day. It's FREE!

HART & VICK, Seeds
94 Stone Street Rochester, N. Y.

WATER-LILIES
Aquatic Plants
Fancy Fish

Just published—a superb catalogue featuring a selected list of Water-lilies, Aquatic Plants, and Fancy Fish for garden pools and tub culture. Many illustrations in natural colors, including six pictures of Fancy Fish. Accurate descriptions of varieties; complete cultural directions for Water-lilies and Water-plants, with instructions for caring for fish. Simple plans for pool-building in the garden, and preparing tubs for garden, porch, or roof-garden.

Write today for a copy of this splendid catalogue

Three Springs Fisheries
10 Pythian Building
Frederick, Maryland

FASHIONABLE
MODERNISTIC
UNIQUE
✓ CACTUS

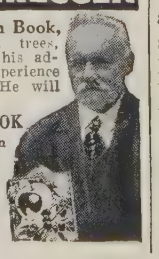
As an introduction to our service, we offer
ROOTED OPUNTAE
Plants at 60¢ each—3 different for $1.50. Try us.
Booklet Cactus Culture 15¢
THE HOME NOVELTIES CO. . Cedar Knolls, N. J.

ASK MR SONDEREGGER

For the FREE 1930 Spring Garden Book, and any special information about trees, plants, or flowers. Get the benefit of his advice which comes from over 40 years' experience in the Nursery and Seed business. He will gladly send you the

FREE 1930 SPRING GARDEN BOOK

You'll find it crammed with useful information about the care and planting of nearly every variety of tree, plant, or flower. Describes many new and interesting species, including valuable kinds developed by Mr. Sonderegger. The 1930 Spring Garden Book is FREE for the asking! Write for it today!



Sonderegger Nurseries and Seed House
134 Court St. Beatrice, Neb.

Pots may be used for seed germination, but boxes, called flats, about three inches deep are best for transplanting into and growing seedlings. A dozen or more half-inch holes should be bored in the bottom of each box to insure perfect drainage and a half-inch layer of ashes or gravel should be placed in each one before filling with the soil mixture. Poor drainage is fatal to seedlings.

Sow seeds thinly and cover in proportion to their size, very small ones merely pressed into the surface and larger ones covered an eighth to a quarter of an inch by sifting very light sandy soil over them. Very fine seed sow easier when mixed with dry sand and the mixture scattered over the surface. Seeds do not need light to germinate, merely moisture and mild heat, but just as soon as they are through the surface, light and ventilation are essential.

The containers of seeds must be watered carefully and regularly; if allowed to become dry during this critical time, many plants will be lost. One of the best ways to water without danger of washing the seed out is plunging the entire container into water nearly up to the rim and allowing absorption to moisten the soil. Another way is to wet a coarse cloth, lay it on the soil and pour the water gently upon it, removing it when the soil is thoroughly saturated. Still another method is to place a thin sheet of tissue paper over the soil, water with a very fine spray and it will readily pass through the paper which may be left in place and the little plants will come up right through it. The flats of transplanted seedlings must also be watered regularly and carefully; if once allowed to suffer from lack of water they may never fully recover. When watering, the soil should be thoroughly saturated; mere surface sprinkling is useless and harmful as it encourages root growth at the surface. The best method is to water thoroughly and then allow them to become almost but not quite dry. This encourages deep rooting,—just what is wanted.

Sunlight is, of course, essential to plant growth, especially seedlings. A south or east window is desirable though a bay window to the south is the best. Upon extremely cold nights some papers should be placed between the glass and the plants to save them from danger of a chill which might set them back. Just after transplanting they should be shaded from hot sunlight for a day or two, but they must have light and air. Ventilation,—that is, fresh air,—should be provided daily, but they should never be in a draft. All of these little things are simple, but they are important and the successful growing of seedlings depends upon them.

When the little seedlings are transplanted into the flats from the seed beds, they should be set from two to three inches apart depending upon whether you are going to leave them there till time to set them out in the garden or transplant them again later. They need more room if they are not to be transplanted. Most seedlings, when three or four inches tall, should be "pinched back", that is, the top should be pinched out. This causes the plant to branch out and become bushy and stocky rather than weak and spindling. Transplanting and pinching back make for good root systems and sturdy plants. In the flats they should be lightly cultivated or the

New Forms & Colors of Old Fashioned Flowers

BASSI'S SEEDS

New Zinnia—Dahlia Flowered "Youth". (See Illustration.) A new addition to the Dahlia flower type. Youth is a beautiful, soft rose, well formed flower, on a robust, vigorous plant. A real acquisition for Zinnia lovers.....Pkt. 25c

Peerless Yellow Aster—At last a real Yellow Aster. Of branching habit. Height about 2 feet. Flowers of good size and form. Color: deep yellow. Very attractive.....Pkt. 35c

Aquilegia—"Blackmore and Langdon's Long Spurred." Finest variety. Various shades ranging from white and salmon to pale and deep blue. Exceptionally large flowered and long spurred. A beautiful variety.....Pkt. 35c

Calendula—"Radio". Entirely new variety. Petals beautifully quilled giving flowers an extraordinary appearance. Extremely globular in shape; does not show center. A real novelty.....Pkt. 25c

New Giant Perennial Larkspur—"Blackmore & Langdon's Hybrids." One of the finest. A giant, English prize-winning strain. Spikes six to seven feet tall.....Pkt. 50c

Dimorphothica—"Ringens" (African Daisy). A new form from South Africa. Large, pure-white flower with a very conspicuous blue ring around the center which adds greatly to its beauty....Pkt. 35c

Larkspur—"Giant La France" (annual) Large, well formed double flower. Well placed on long stems; beautiful salmon pink color.....Pkt. 25c

SPECIAL SEED COLLECTION
One packet each of these 10 outstanding novelties, valued at $3.30 for $3.00

Larkspur—"Los Angeles". Same growing habit as the La France but with a richer color. Salmon ground overlaid with a brilliant and pleasing rose with beautiful large double flowers.....Pkt. 25c

Petunia—"Fimbriata Coerulea" (Giant). Steel blue fringed. Most attractive. Deeply fringed, heavily veined, steel blue with throat of deeper blue Pkt.....50c

Verbena—"Mammoth Golden Queen". A clear golden yellow in verbena; a valuable plant for bedding. This color is unusual in Verbena.....Pkt. 25c

Ranunculus—"Double Giant French". Large, double, buttercup-like flower on long stems. Beautiful shades of bronze, etc. Desirable as garden plant and cut flower.....$1.25 per dozen, 8 for $1.00

Special Offer On Montbretias
(Special mixture). Beautiful gladiolus-like flower on long slender stem. Blooms from July to frost. A very satisfactory cut flower.
.....25 for $1.50, 100 for $5.00 Postpaid

Write today for our 1930 book "Everything for Spring Planting." It's free!

COMBINATION OFFER:
$5.75 Value for $5.25

10 Packets of Seeds here described	$3.00
25 Montbretias, special mixed	1.50
1 Dozen Ranunculus, special mixed	1.25
$5.75 Value, all Postpaid for $5.25	$5.75

Bassi Frères Inc. de Paris

SEEDSMEN AND NURSERYMEN
478 Main Street New Rochelle, N. Y.

50 years of KUNDERD *Gladioli*

50 YEARS AGO A. E. Kunderd began growing Gladioli as his life work. Today Kunderd Gladioli are recognized as the world's best. Buy from the originator and be sure of genuine Kunderd varieties. Write for the Golden Anniversary Gladiolus Book. Describes hundreds of varieties. 130 new Gladioli offered for the first time. 63 pictured in color. Use coupon.

A. E. KUNDERD, 153 Lincoln Way West
Goshen, Indiana, U. S. A.

Dear Sir: Please send me your FREE Golden Anniversary Gladiolus Book.

Name_____

St. or R. F. D._____

City_____State_____

soil will become packed and hard, excluding air so necessary to plant growth.

Many experienced amateurs pot up their seedlings, but this is not necessary except with such things as poppies, mignonette, sweet sultan, nasturtiums and salpiglossis. Some of the above can only be grown this way and all of them will do better if potted. Most of these develop root systems that will not transplant in the usual way.

There is but one serious disease to be feared with seedlings and this is a fungus growth commonly called "damping off". Excess moisture and humidity encourage it and the growth is so quick that an entire flat may be destroyed in one night. Refrain from watering late in the day so that the soil surface may be practically dry. Sand as a medium for sowing seeds in has the advantage of drying out quickly and is not nearly as likely to harbor this disease. Of recent years science has developed a means to combat its ravages. Products known as "Uspulun", "Calogreen", "Semesan" or "Dipdust" may be purchased from seedhouses and applied either in the form of dust or as a liquid.

It is very important that seedlings be kept growing vigorously; if stunted by neglect, their tissues become hardened and frequently they never recover. Proper soil, regular watering, ventilation and sunlight are all vital to their growth. None of these things are difficult to provide, but most of the failures can be traced to the absence of one or the other.

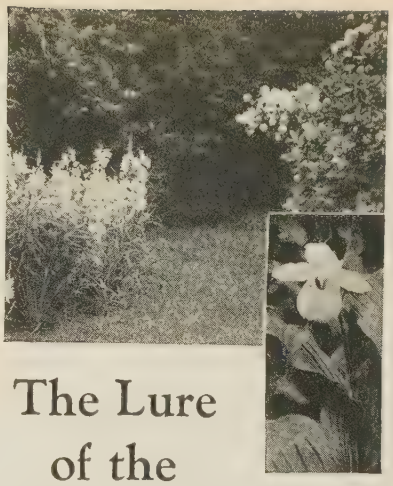
Except for the varieties mentioned in the beginning of these notes, most seeds should not be started too early. Fast growing varieties will get too far advanced before they may be planted outside. It pays, however, to get your seeds on time, before the height of the spring rush. Plan the varieties you will plant and make a rough diagram of the planting plan. Mark each variety of seed with its name as planted and the date, so that you may know what to expect of them. The date will give you a check-up on the blooming time and may aid you in future years.

Use the greatest care that no gas escapes into the air of the room in which seedlings are grown. Even in extremely small quantities the effect upon plants is very harmful. With some things as little as one part in four hundred is fatal. The damage results from overstimulation. Daily ventilation is important but cannot prevent injury if gas is allowed to escape into the room.

The plants in our gardens which we have raised from seed have an especial value for us. We point to them with enviable pride; they give the garden an added feeling of ownership. Things bought from the florist may give as much bloom, but there is lacking that personal satisfaction of having produced them from seed yourself. The seed we plant, the flowers we raise ourselves, partake of the creative life, so abundant all around us, and we can all agree with Charles Warner, who wrote:

"There is life in the ground, it goes into the seeds, and also, when it is stirred up, goes into the man who stirs it."

DO NOT MISS
MR. WARE'S ADVICE
IN MARCH



The Lure of the Beyond

To those interested in wild plant life, "The Beyond" starts at the edge of the Woods—and coaxes! Amid shifting shadows and frolicking sunbeams, develop the most precious offspring of the native flora. This nursery specializes in plant materials for naturalistic gardens. Let's get acquainted through offers that follow.

Cypripedium spectabile
The Showy Lady's Slipper

Does well in soil composed of leaf-mold or peat, and prefers moist, shady situations. This is the showiest of our native Orchids.

1 to 2 crown plants—3 for $1.00, 10 for $3.00
3 to 4 crown plants—3 for $2.00, 10 for $6.50

Trillium grandiflorum
(Three-leaved Nightshade)

A charming member of the Lily family, easily grown in moist situations.

Beautiful white flowers in early Spring.

$1.00 for 10; $6.00 per 100

Hepaticas

Among the brightest and earliest of the Spring flowers, thriving equally well in sun or shade.

Acutiloba bears white, pink or purple flowers.

Triloba is pink or dark purple. Blooms earlier than its western cousin.

Prices, either variety, 5 for $1.00; 10 for $1.50

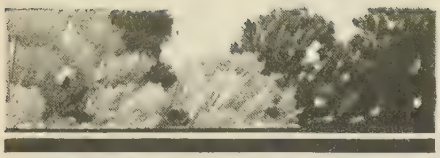
Mertensia
(Virginia Blue Bell)

A great companion to Daffodil and Tulip plantings. Pink buds, blue and bluish white open flowers—a beautiful color combination for any situation.

5 for $1.00; 10 for $1.50

If you love Wild-flowers, Ferns and other plants for naturalistic gardening you will find *Our Catalog* the same source of inspiration which it is to thousands of Gillett customers throughout the country. *Gladly mailed free* on request and please mention this publication.

GILLETT'S
Fern and Flower Farm
7 Main Street, Southwick, Mass.



A WATER LILY POOL *for your garden* ~ ~ ~

NEW beauty, gorgeous new colors, exquisite fragrance and fascinating new interest may be added to your garden by addition of a Water Lily Pool.

In every garden, large or small, there is room for a Water Lily Pool, or at least a simple tub garden. Marvelously beautiful effects can be achieved quickly and with little effort or expense.

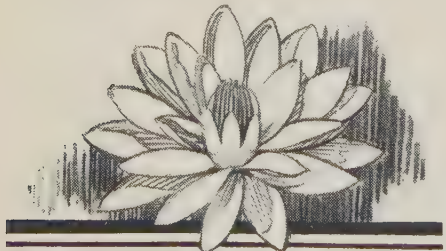
You can enjoy a Water Lily Pool this summer if you will plan now. No garden is modern without one.

Complete Water Garden—Only $5
Choice of pink, blue, yellow or white Water Lily; 6 Aquatic Plants; 6 Border Plants; Cedar Water Lily Tub and pair of Snails. All for $5

Marliac Trio Water Lilies $5
Three fine hardy Water Lilies. *Chromatella*, a rich yellow. *Marliac Rose*, deep rose color. *Marliac White*, a large white flower. All three for only . . $5

Illustrated Catalog Free
Shows you how to construct a pool or plant a tub garden. Describes our immense collection of Water Lilies and Aquatic plants. Many illustrated in natural colors. Gives cultural directions. Write for Free copy.

Collection of 6 goldfishes, 6 calico or gingham fishes, 2 clams, pair of American Salamanders and 18 scavengers. All for . . $5



Wm. Tricker Inc.
202 Brookside Avenue — *Waterlilies* — Saddle River New Jersey

T. R.'s Bird List

Mrs. L. W. Maynard of Washington, D. C., has long been active in local ornithological circles and was particularly so at the time Theodore Roosevelt was in the White House. His interest in birds is, of course, well known and Mrs. Maynard tells of one interesting evening at the White House when the late Richard Kearton was the guest of the President and was showing the first motion pictures of birds exhibited in this country. Later in the evening Mr. Roosevelt was talking birds to a group and Mrs. Maynard suggested to him that he make a list of the birds he had seen in the White House grounds for a new edition of the local bird book.

"I will do better than that for you," the President said. "I will make you a list of all the birds I remember to have seen in and around Washington." As he turned away he added, "You had better remind me about that list. I may forget it. Send the reminder to Mrs. Roosevelt; then it won't get into the waste basket."

Mrs. Maynard sent a note of reminder the next day, and, within twenty-four hours, there came back a list of ninety-three species listed in Roosevelt's own characteristic handwriting. The list was printed in the book and separately. We have just discovered that Mrs. Maynard has some five hundred copies left of this separately-printed list. She tells us that she is willing to dispose of them for twenty-five cents each. Anyone interested in having this rather historic list should write to Mrs. L. W. Maynard, 1882 Columbia Road, Washington, D. C.

Louisiana Birds Increase

The "white wings of the sea"—the seabirds nesting in the wild life reserves along the Louisiana coast—are on the increase, according to Stanley C. Arthur, director of the wild life division of the Department of Conservation of Louisiana, who this summer made a survey of Breton and Chandeleur Sounds. In California Bay, Mr. Arthur and his associates found that the Louisiana herons, snowy egrets, little blue herons, black-crown night herons, and white-faced ibis were all present in greater numbers. The brown pelicans, emblem of Louisiana, were also more numerous, on their breeding grounds on the North Keys of Free Mason Island, Mr. Arthur discovered. The Department of Conservation banded hundreds of pelicans, terns, laughing gulls, skimmers and other sea birds on their trip, to determine their migratory range.

A Cat Trap

For those who are bothered by vagrant cats who prey upon the birds one has been seeking to attract around the home grounds, the U. S. Department of Agriculture has brought out a leaflet entitled *How to Make a Cat Trap*. This is Leaflet No. 50 and will be mailed on receipt of five cents in cash by the Superintendent of Public Documents, Washington, D. C.

Alpine Plants
Will Give Charm to Rock-Gardens

Among the "Alpines," or rock-garden plants, you will find some of the loveliest specimens that Nature gives to gardeners.

In the Independence collection are many rare kinds—varieties seldom found in ordinary groups. These unusual plants require no more care than common sorts; in hardiness and habit they are equal to any of the varieties generally found in rock-gardens. Hardy Ferns bring the fragrance of the woodlands; dwarf Phlox give a touch of modern color; and Heather calls up visions of valleys and hillsides. All these and many other Alpines are described in our 1930 catalogue.

Alpines for Rock-gardens

A booklet telling how to plan and plant the garden, select the plants, and care for them. We will gladly mail a copy on receipt of your name and address.

BUSKIRK'S
Independence Nurseries
Box 31 Independence, Ohio

This book tells how

"How to Landscape The Home Grounds" is written *specifically* for those who wish to landscape their own grounds without the aid of a professional Landscape Architect.

It was compiled by a prominent Landscape Architect and is written in simple language that anyone can understand.

EACH STEP ILLUSTRATED

Simple charts and drawings show you each step from start to finish. Plans and cost estimates for every type of home are included.

This book tells in detail how to arrange trees, shrubs, vines, etc.; how to make an Outdoor Living Room or a lovely Rock Garden, and how to choose exactly the right variety for each location.

SEND ONLY 10c

THE STORRS & HARRISON CO.
Box 127 Painesville, Ohio

Gentlemen: I enclose 10c for booklet "How to Landscape The Home Grounds."

Name_____

Address_____

3 Delightful Schling Specialties

NO. 1.

Venidium Fastuosum

The Novelty of the Season!

We have here an Annual of outstanding merit and so easy to grow that anyone can enjoy it. Brilliant orange flowers 4 inches across with shining black center displayed to perfection in a setting of soft gray woolly foliage make this a most desirable and brilliantly showy plant. Received award of merit R.H.S. and a place in the Annals of the Botanical Magazine. **Packet $1.00. 6 packets for $5.00**

NO. 2.

"Get Acquainted" Collection

A $3.25 value for $1.00

Schling's American Beauty Aster—Gigantic flowers, 7 inches across, 3 ft. stems, same color as American Beauty Rose.....Pkt. 35c

Schling's New Orange Glory Calendula—Golden orange perfect form. Very double.....Pkt. 25c

Schling's New Annual Double Fringed Hybrid Chrysanthemum—In a charming color range, very attractive in both garden and vase. Pkt. 15c

Schling's Semi-double Crested Cosmos—Of giant size with double rosette-like center.....Pkt. 25c

Schling's New Hybrid California Poppies—Lovely new shades of pink, scarlet chrome, copper red, claret, purple, etc..... Pkt. 25c

Schling's New Giant Hyacinth Flowered Larkspur—Excels all others in length of stems, size of flower spikes and general vigor.....Pkt. 35c

Schling's New French Marigolds—Glorious—Rich velvety brown, blotched on brilliant velvety scarlet. A gem.....Pkt. 75c

Schling's New Erysimum, Orange Beauty—Pale orange-yellow, wallflower-like spikes. Delightfully fragrant.....Pkt. 25c

Schling's New Giant Early Flowering Pansy—World Record—Flowers of immense size on long stems. In bloom from March to December .....Pkt. 25c

Schling's New Marvelous Dahlia-flowered Zinnia—True aristocrats. Flowers 6 to 7 inches, like huge dahlias.....Pkt. 40c

NO. 3.

Schling's Giant New Pansy

Mrs. Pierre S. du Pont

A gem of the first water. Rich, golden apricot blushed with salmon—as glorious as a June dawn. Pure, without even the faintest trace of the usual center-lines to mar its beauty, it forms a stunning contrast and perfect complement, especially to the purple varieties.

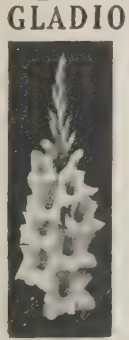
Single pkts. $1.00; 6 pkts. for $5.00; 12 pkts. for $9.00.

All Three Specialties and our "Book for Garden Lovers" (35c a copy)—A $5.60 value for $2.75.

Schling's Seeds

MAX SCHLING SEEDSMEN, INC.
618 Madison Ave., North New York City

GLADIOLUS BOOK FREE!



Send for my new 36-page Gladiolus Book, describing 175 exquisite varieties, many new. Tells how to grow. 45 illustrations. It's free!

My famous beautiful RAINBOW COLLECTION will delight you. 1 bulb each of 30 varieties (not labeled) all colors, blooming size, planting hints included, satisfaction guaranteed, $1.00 postpaid.

H. M. GILLET, Gladiolus Specialist
Box 458 New Lebanon, N. Y.

Mail Robber

The days of the Wild West are not over, even though the stage coaches have passed and the pony rider express has given way to the airplane. Still the robberies of the U. S. mail, so marvelously played up at the 15-20-25¢ cinema palaces, have not gone out of fashion. The latest, according to the Yellowstone Nature Notes, took place in Yellowstone National Park, and a big black bear was the culprit. Dick White, a ranger, was carrying the mail to different road crews, and left it in the car while he lunched. When he returned, it was gone, and in a high nearby tree, a huge bruin was inspecting his prize. He turned it over and over, without paying any attention to shouts and blows upon the tree; finally, he dug into the centre of the bundle, and extracted a box. Opened, it proved to contain chocolates, which the bear slowly, with no apparent shame or fear, devoured one by one. After his feast, he examined the package for further delicacies, then reluctantly dropped it, and settled down in bored fashion for a rest until the indignant mailman, powerless to shoot the felon or to lock him up, went away.

Growing Narcissi

An unusual episode in flower growing was unearthed recently by W. E. Bowers of Selma, Alabama. A few years ago he planted some paperwhite narcissus in the yard, and a year or so later set out some nerine or spider lily bulbs in the same place. When digging in the garden, preparing the soil for annual flowers, he found the two bulbs attached to each other as pictured above. An offset shoot of the paperwhite bulb grew directly under a nerine bulb. Instead of growing around the nerine the paperwhite preferred to become a part of the former. There was no mark to indicate just where the union took place. The bulbs are now potted, and the results will be very interesting to watch.

Sound Effects

The bears of Yosemite have long since become used to the movie camera. They love to gambol before it, and do their best, it seems, to act. The still camera, held by a visitor, is different, however, and so is the movietone. No one has been able to get them to "woof" for the Talkies. James V. Lloyd, naturalist ranger, reports, however, that when a little molasses was put on the microphone, three of the bears at the feeding platform uttered "lap-laps" that will be heard around the world.

Ohio Educators

A wide range of subjects, with a keynote of "reaching the individual," will feature the tenth annual Ohio State Educational Conference to be held in Columbus April 3 to 5. Among the speakers will be Robert M. Hutchins, president of the University of Chicago. A registration of more than five thousand is expected.

Burpee's Seeds Grow

free Garden Book

IN planning your garden consult Burpee's Annual Garden Book first. It offers the finest and widest possible information and selections for growing more beautiful flowers and more improved vegetables. It tells you how to succeed with your garden and offers you an opportunity to get more pleasure and profit from it.

Market Growers and Florists use Burpee's Annual as a reference book—more than a million amateurs use it as their garden guide.

New Vegetables and Flowers

Read all about the new Burpee's Gold Coin Sweet Corn, Burpeeana Cauliflower, new Sweet Peas, new "Gold Medal" Giant Dahlias, new Gladflowers, new Asters, new Zinnias, new Giant Verbenas, and many other new and worth while varieties fully described in this book.

If you have a garden, Burpee's Annual will be mailed to you free. Write for your copy today.

TEAR HERE

W. ATLEE BURPEE CO.
286 Burpee Building, Philadelphia

Send me a free copy of Burpee's Annual Garden Book.

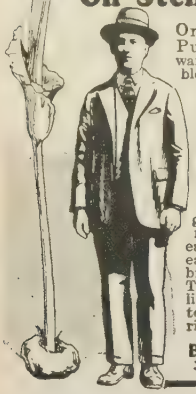
Name .....

R.D. or St. .....

P. O. ..... State .....

Sacred Lily of INDIA

Blossoms 3 Feet Long On Stems 7 Feet High



One of nature's plant wonders. Put a 4-year or older bulb in a warm place, in the winter, and it will bloom without earth or moisture, producing a magnificent calla-like red lily of monstrous size. Single blossoms often measure 3 ft. in length. It has no foliage while in bloom, but if planted outdoors in the spring, it will produce a very attractive palm-like plant 4 to 5 ft. tall. Grows quickly and is a rare addition to any home or garden. We can supply mammoth 4-year old bulbs at **$10** each; or 1-year-old bulbs at **$1** each, postpaid. You can make big money growing these bulbs. They are easily grown and sell like wildfire. Every bulb guaranteed to grow. Order TODAY right from this ad. *Catalog Free.*

BURGESS SEED & PLANT CO.
340 S. L. Galesburg, Mich.

Now You Can Have WATERLILIES in Your Own Garden

Wonderful colors, delightful fragrance; blooming day or night. All are easily grown.

Send today for our new booklet of Waterlilies, Fancy Fish, Water plants and aquariums, with instructions for Pool Building.

Indoor Water-garden

Have an aquarium **NOW.** This collection gives all you need.

12 Water plants (in variety) — 1 pair Japanese Nymphs
6 pair Snails (2 kinds) — 1 pair Shubunkins
30 Plants, Fish and Snails (enough to balance a 12-gallon Aquarium) only **$5.50** — 1 pair Japanese Fantails

Be sure to send TODAY for our Free Booklet

ARLINGTON WATERLILY GARDENS

682 Forest St., Arlington, N. J.

STUPENDOUS OFFER

100,000 Rose bushes, 2 year field-grown grafted

50 varieties for only $.80 each . . . doz. $8.00

Exhibition Gladiolus		Exhibition Dahlias	
1000 . . .	$25.00	Doz.	$3.00
100 . . .	2.75	Each	.30

Azaleas blooming size, 40c each. 2-3 year old Blue Spruce, 40c each. 2-3 year old Norway Spruce, 40c each. Chrysanthemums, 40c each. *Act quickly—they are going fast.* Price list mailed FREE upon request.

HOLLAND BULB COMPANY
Dept. N — Lake Como, N. J.

GLADIOLI McKibbin

Wonderful varieties, plain and ruffled, strongest stocks, prize-winning strains, grown, cared for and selected by a gladiolus lover. Not the most varieties, just the best. Every bulb perfect, sure to flower gloriously.

Write today for my list containing great introductory offer.

JOHN H. McKIBBIN
1399 Division St. — Goshen, Ind.

A GUIDE TO THE BEST Trees, Shrubs, Plants

Roses, perennials, bulbs, etc., to beautify your home and make your orchard and garden profitable. New shrubs, roses and other new rare varieties. 54 years devoted to growing the best at surprisingly low prices. Buy direct. Write today for 1930 catalog. *It's free!*

WOODLAWN NURSERIES
895 Garson Avenue, Rochester, N. Y.

Saving Columbus' Trees

When Columbus, Ohio was laid out, four rows of trees were planted along about a mile of Broad Street, and the home owners abutting on the street were proud of their elms. Two rows were in the middle of the street, making a central roadway carrying four cars abreast; and two bordered the curbs, along outside lanes about fifteen feet wide. But Broad Street, which runs through the centre of the town, became commercial, rather than residential, and the move was on to cut down these beautiful trees. The city council, under pressure, voted the removal of them; its action, however, was not final, for according to the city's charter, all ordinances must have the approval of a referendum. And the supporters of the trees won, by a few hundred votes last August, at the primary election. It is to be hoped that the matter is settled, now, once for all, or if it is again raised, that even a more signal victory will be won by the trees. Those who have seen the bareness of Pennsylvania and Connecticut Avenues in the Capital since the trees have been cut down and compared them to the tree-canopied New Hampshire and Massachusetts Avenues, will not wish to see Columbus, too, strip herself of her verdure.

Clever Coyotes

Just to prove that the human race has no monopoly on guile, two coyotes in Yellowstone Park performed a confidence game that would have done credit to O. Henry. These two animals, reports Newell F. Joyner, Park Ranger, in the Yellowstone Nature Notes, chanced along the Yellowstone River at a time when a flock of ducks were reposing on its surface. They deliberately paraded along the bank, then, after being sure they were seen, went back into the sage. One circled around to a rock close to the river bank, and began waving his tail, which alone, of all his body, could be seen by the ducks; the other slowly sneaked back to the river bank. The ducks could not resist the temptation; they had to find out what it was all about. Closer they came to the waving tail; there was a gray flash, and two of the birds did not rise.

Brown Pelican on Coast

The brown pelican, for the first time in history, is breeding on the North Carolina Coast, T. Gilbert Pearson, president of the Natonal Association of Audubon Societies reports. Nesting birds have been found on Royal Shoal Island in Pamlico Sound. Dr. Pearson states that the only other breeding places for the bird on the Atlantic coast are a small island in Bulls Bay, S. C., and one in Mosquito lagoon, near Titusvlle, Fla. Dr. Pearson some years ago was one of the men who prevented untold slaughter of these creatures by fishing interests that believed them destructive. He proved that their numbers were much less than supposed, and that their diet consisted largely of fish of no use commercially.

KINKADE GARDEN TRACTOR

and Power Lawnmower

A Practical, Proven Power Cultivator for Gardeners, Fruit Growers, Truckers, Florists, Nurserymen, Suburbanites, Country Estates and Poultrymen.

New Low Prices-Easy Terms

AMERICAN FARM MACHINE CO
1036 33rd Ave., S. E., Minneapolis, Minn.

Beautify your garden with a pool. Our new 36-page catalog gives full information on how to build and care for your water garden. Inexpensive post-paid collections and over 100 varieties of exquisite and rare lilies are shown, many in full color. A veritable handbook of water lily lore is yours for the asking.

Send for FREE Catalog Today!

JOHNSON Water Gardens
N230 — Hynes, California

GARDEN FURNITURE

Send 10c for BETTER BUILT CATALOG showing almost one hundred attractive pieces for lawn and garden.

Satisfaction Guaranteed

IOWA MANUFACTURING CO.
948 Third Street, SAC CITY, IOWA

Keep ferns lovely all winter long

Use Plantabbs. Amazing new discovery! Small, white, odorless tablets more powerful than finest fertilizer or manure. One tablet to pot each week makes ferns, geraniums, begonias, all potted plants grow like magic.

No Plantabbs

FREE BOOK—32 pages, interesting, highly illustrated, tells how to raise and care for all potted plants, FREE with order. Large package Plantabbs, full winter supply, $1.00 postpaid. Guaranteed to improve your plants or money returned.

Plantabbs Used

PLANTABBS CORP.
2105 Court Square Bldg. — Baltimore, Md.

DAHLIAS

Look for the Trade Mark when looking for quality

For more than 40 years this Trade Mark has stood for quality and fair dealing. Stock true to name and free from disease. 1930 introductions, novelties and standard varieties. Catalog (36 pages) free.

W. W. WILMORE
Box 382
Denver, Colorado

ROSE GUIDE FREE

"New Guide to Rose Culture," our beautiful manual, shows many roses in natural colors. New and old varieties. Write for your copy—it's free. Lists 500 roses and other plants. Gives hints for care and planting we have learned in 80 years. Invaluable to beginners. Special offerings will interest you. Send today! *Address*—

THE DINGEE & CONARD CO., Box 207, West Grove, Pa.

DINGEE ROSES

Scott's Creeping Bent for Perfect Lawns!

Sod in six weeks! A rich, velvety stretch of lawn that chokes out weeds before they can grow! With proper care no reseeding is ever necessary. You will have a deep, thick, uniform turf that's everlasting and makes your home a beauty spot. That's what you'll get if you plant Scott's Creeping Bent.

The New Super-Lawn

Creeping Bent—long recognized as the ideal grass for golf putting greens—is now producing Super-Lawns. Instead of sowing seed, you plant stolons or the chopped grass—and in a few weeks you have a luxuriant lawn like the deep green pile of a Turkish carpet.

This little book "Bent Lawns" is free to you. It is a valuable treatise on how you can have beautiful lawns. Write today for your copy.

O. M. SCOTT & SONS CO.
161 MAIN ST. • MARYSVILLE, OHIO

Star Roses

When you plant "Star" Roses you do so with utmost assurance that they will grow and bloom. Every plant is trademarked and *guaranteed* to bloom. Grown by rose specialists, with over 30 years successful rose growing experience. Our 1930 "Star Guide" describes over 200 up-to-date varieties—46 shown in natural colors. If you want dependable roses, send for your copy of "Star Guide to Good Roses" today.

The CONARD-PYLE CO.
Robert Pyle, Pres.
Star Rose Growers
Box 28 West Grove, Pa.

Choose from Our 75 Varieties of Beautiful
WATER LILIES

These richly colored, fragrant, easy-to-grow garden flowers may be planted from April until the last of August. Ours are the largest Aquatic Gardens in America. Every root *guaranteed!* 75 beautiful Varieties from which to make your choice in our free, illustrated Catalog. Send for it NOW.

The W. B. SHAW Aquatic Gardens
Dept. A, Kenilworth, Washington, D. C.

Observing Ants

The antics of creatures infinitely smaller than ourselves are often much more interesting and amusing than those of human beings. Pauline Sandholdt, of Pomona, California, who is responsible for the following notes, seems to have found considerable to engage her attention when she made her attempt to find baby ants.

"One morning I watched the ants wake up and start about their business. There were three or four sleeping around the door of the hole and some farther away that had been out at the ringing of the ant curfew and had not striven to get home that night. Those who had slept out were covered with dew and looked like they were dead but were all up and going before noon. One thing about being a sick ant is that you don't lie around and do nothing for a day or two; you are licked back to life no matter how dead you look and after your sister thinks you are all right you are left alone until you are strong enough to go to work.

"One of the ants who slept at the door of the hole woke up and dragged two of her sisters, stuck together, around, apparently with the idea of waking them up. She had no success except that one got up and walked behind a small clod and went back to sleep again. About that time one of the guards in the nest below came to the top. She joined her sister above and together they hunted around for the other three. When they found one they would try to wake her up but success was slim.

"I touched one of the sleepers and it rolled right over the hole. Maybe it called that being a good guard but if it was in a human army it would be shot at sunrise.

"Soon a few more came up from below and walked around, then they went back. It wasn't long until they went about their daily business, only sleepily. They weren't up to par for several hours.

"In hopes of getting some baby ants in the different stages of ant babyhood I poured water down a hole of red ants. The water filled the hole with mud and packed a few ants in also.

"As soon as the water had soaked in the workers went to work clearing the passageway. At times a solid mass was working at the hole. Some ants walked over their sisters to get to the hole. These ants thoroughly spoiled my idea of all worker ants being hard workers. Some would take a load from the hole and bring it back and dump it right in the way of the other workers for no visible reason.

"When an ant excavated one of its sisters it would take it a long way from the hole and lick it back to life, then she would leave her sister to go back and work with the others. One ant carried a sister in a semicircle around the hole and then I lost them though I am sure she must have gone on farther. The licking operation takes only a second or two and appears to be to free the victim from the mud. Some of the ants go around coated with this mud.

"When the passage-way was clear one ant walked out on the ceiling, looked around and walked back the same way.

"A lady bug who appeared to have been in an auto accident, at least one hood was off, part of the engine wrecked and the rest badly tattered, went for an unexpected swim in the pond over the ant hole and I had to rescue her with the point of my pencil."

Here is *your* copy *Free*

The
Storrs & Harrison Co's. 1930 Spring Catalog

Illustrating and describing America's most complete collection of

Trees • Plants • Shrubs
Vines • Seeds • Etc.

Just off the press—the beautiful new catalog of America's Oldest and Largest Departmental Nurseries!

More illustrations in full color than ever before. More new charts and diagrams to help you beautify your grounds the modern way.

The most complete listing of favorite trees, plants, shrubs, vines, seeds, etc., ever published by a Nursery—and, in addition, the uncommon varieties not usually found in the average Nursery catalog.

The Outdoor Living Room and Rock Garden

There are chapters giving specific, easy-to-follow instructions on how to make an Outdoor Living Room and Rock Garden. How to plan them—what to plant and how to care for your plantings to assure success.

Just the kind of a catalog you will find most helpful, and it's FREE to you.

Mail this Coupon

Whether you plan to landscape your entire place—make one of the new Outdoor Living Rooms—build a Rock Garden, or merely set out some new plants, you need this catalog. SEND FOR IT NOW.

***The* Storrs & Harrison Co.**
Painesville, Ohio.

Box 125
Gentlemen: Please send me FREE, a copy of your 1930 Spring Catalog.

Name.....

Address.....

SAWYER WATER GARDENS
HARDY WATERLILIES
Write for catalog
ELLET , , , OHIO

What makes a good
PLANT LABEL GOOD?
It must be impervious to moisture, must retain its markings, and must not girdle the Plant—WE HAVE IT.
Sample Line for the Asking
THE AQUAPROOF PRODUCTS CO.
2175 East 76 St. Cleveland, Ohio

STANDARD GARDEN TRACTOR
Plows Seeds Cultivates Mows Hay and Lawns
A Powerful Tractor for Small Farms, Gardeners, Florists, Nurseries, Fruit Growers and Poultrymen.
DOES 4 MEN'S WORK
Walking & Riding Equipment
Free Catalog—Does Belt Work
STANDARD ENGINE COMPANY
Minneapolis, Minn. 3209 Como Ave. Philadelphia, Pa. 2457 Chestnut St. New York, N. Y. 196 Cedar St.

A. E. WOHLERT
The GARDEN NURSERIES Narberth Pa.
Oriental Flowering Trees
America's Finest Collection
Japanese Rose Flowering and Weeping Cherries, Flowering Crabs; in all varieties and sizes. Send for free book with color illustrations.
A. E. WOHLERT
927 Montgomery Avenue
Narberth, Montgomery Co., Pa.

FLOWERS SPECIAL INTRODUCTORY OFFER
Buy from the Grower
50 varieties of Best Perennial and Annual Flower Seeds 10c
10 Large Flowered Exhibition Gladioli Bulbs, all colors 25c
6 choice Dahlias, all different colors, each labeled, $1
7 choice, mammoth flowered Cannas, all different, $1
5 Very Choice Iris, all different colors, each labeled, 50c
10 large field grown, Hardy Plants, all different, labeled, $1
Catalog Free.
ROSE SIDE GARDENS, Box 72, WARWICK, PA.

New Varieties of Growing Things
"Approved by Green's". Write for our free 64 page Catalog, illustrated in Nature's colors, with helpful planting suggestions. Complete landscape service. Buy direct and save one-half. Satisfaction guaranteed. Cash discounts for early orders.
GREEN'S NURSERY COMPANY
16 Green Street, Rochester, N. Y.

Walsh Garden Tractor
and Power Mower
For Gardeners, Florists, Fruitmen, Suburbanites
Plows, Seeds, Cultivates, Mows Lawns & Hay
Single & Twin Engine-Belt Jobs-Walk & Ride
SPECIAL FACTORY PRICE
New Improved Models—*Catalog Free*
WALSH TRACTOR CO. Minneapolis, Minn. 3324 Talmage Av. SE

STRAWBERRY PLANTS
Send for Allen's 1930 Book of Berries, a mine of reliable information about *Strawberry Culture,* varieties, PLANTS. Write today for your copy—*free.*
The W. F. ALLEN CO.
270 Market St. Salisbury, Md.

ROSE GUIDE FREE
SEND for our beautiful manual, "New Guide to Rose Culture." Exquisitely illustrated with famous Dingee Roses and other plants, in full natural colors. Gives wealth of information gleaned in 80 years on care, varieties, planting—free. Lists 500 roses and plants, new and old. Invaluable to beginners. Will help you beautify your home. Write for your copy today.
THE DINGEE & CONARD CO., Box 207A, West Grove, Pa.

FREE VICK'S GARDEN and FLORAL GUIDE
Just the book you need. All about growing vegetables, flowers, plants, bulbs. Illustrates and describes valuable new varieties and choicest standard kinds. Attractive offers. *Send for Free copy today.*
JAMES VICK'S SONS Inc. Rochester, N. Y. 78 Pleasant St.
Oldest Mail Order Seed Concern In America

NUT CROPS
The North's future soil production
Progressive farmers are planting groves of improved grafted nut trees. Learn why. Send for free price list or enclose 10c for literature.
John W. Hershey, Nut Trees, Box 65 (I), Downingtown, Pa.

Nature Poem Contest

More entries than ever before were made in the annual Nature Poem contest of the Chattanooga Writers' Club, which awards the Elberta Clark Walker Memorial prizes each year for the best Nature poem from contestants generally and for the best poem from a southern writer. The nationwide prize this year was won by Miss Clara Mae Barnes of Boise, Idaho, for her poem "To the Poet of the Wilderness." The prize to the southern poet went to Miss Berta Hart Nance of Albany, Texas, for her poem, "Carlsbad Cave." The 1930 contest will open May 1 and close November 1. Mrs. John H. Cantrell is in charge of awarding these prizes which were established by Robert Sparks Walker in memory of his wife.

Pony Prospecting

"Soapy" was only a pack-horse, and as pack-horses go, he went, bucking and straying and causing trouble for his master, Joe Billings, prospecting for gold in the Frying Pan Mountains south of Jasper Park, Alberta. But now he rests with a monument at his head and a fond memory in his master's heart. Pickin's were mighty thin last summer, and Joe just about gave up. To make matters worse, on the day he was to strike back to the Canadian National Railroad, 60 miles to the north, "Soapy" ran away. He followed him and found him —standing on rocks bearing rich veins of gold. Only the best of rewards was good enough for "Soapy," Billings thought, so he arranged for a whole field of clover for the pack-horse that had made him rich. But, alas, the stomach used to sparse mountain grass could not stand the diet. So now other pack-horses are lugging out the gold he found.

Farming Terrapin

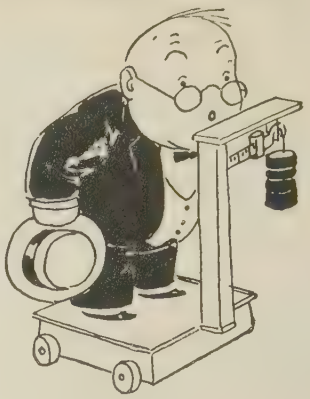
With the resumption of the terrapin market in North Carolina, partially due to the open season after five years of protection, as well as to general prosperity, terrapin farming in the Tarheel State offers an attractive field. There is only one commercial farm in the state now, that owned by James O. Bowden on Wrightsville Sound, near Wilmington, the Conservation Commission reports. The U. S. Bureau of Fisheries conducted a large farm at Beaufort in 1909, where thousands of animals were turned out each year, but decrease in prices caused it to be closed.

Farm Beautification

Landscaping and planting about the farm are covered in an excellent new pamphlet from the U. S. Department of Agriculture, entitled *Beautifying the Farmstead.* This is listed as Farmers' Bulletin No. 1087 and can be obtained from the Superintendent of Public Documents, Washington, D. C., for 10 cents.

EVERY GARDENER AND GROWER
WANTS TO KNOW how to improve the soil and grow more and finer vegetables, more and better fruit, the finest flowers, plants, trees and shrubs, hot house methods, etc. All told by E. C. Vick in 4 new books that answer problems and assure success. Price $6. Sent free on approval, payable $1 a month if satisfied. Send name today and get books at publisher's risk. Garden folder free. THEO. AUDEL, 65 W. 23 St., New York. Dept. V 25

Just a matter of calories!



NOW SAFE reducing is a relatively simple matter. It is possible to weigh just about what you wish and still keep on eating—providing you know what to eat! Your caloric intake is the thing to watch.

Given the calories in various foods, the rest is a simple process of addition and subtraction. A fascinating hour—checking up on your own and your family's calorie totals for the day. To reduce the total there's nothing to prevent swapping a rich in fuel food for one of lower caloric value.

A list of suggested foods for reducing diets, with their protein grams and calories per average serving is given in "Reducing Diets", appearing in February HYGEIA. This article contains seven menus and recipes with a caloric range of from 1076 to 1504—showing the wide range of diet possible while reducing SAFELY.

"Reducing Diets" is a treat for all the family. Don't miss it in the February HYGEIA.

Schedule for February HYGEIA

A galaxy of splendid health articles is included in the February issue of HYGEIA the Health Magazine of the American Medical Association. Included with the above feature, is: "Cancer of the Mouth——Its Prevention and Cure"; "Lying Labels—Banned by the Food and Drugs Act"; "Prevalence and Treatment of Syphilis"; "How Does Your Child Talk?", a health play for children, the editorials, etc. HYGEIA provides accurate health information interestingly written, which helps safeguard the health of you and your family. Subscribe now at the special introductory offer.

A "Get Acquainted" Offer

The HUMAN FACTORY Chart from a recent issue of HYGEIA dramatically portrays the functions of the human body in terms of machinery—a formidable array of pumps, pulleys, filters, wheels, belts, etc., carrying on the complex operations. This extraordinary color chart will be sent with each new subscription to HYGEIA at the "Get Acquainted" Offer—6 months for $1.00! HYGEIA regularly sells for $3.00.

6 months of HYGEIA and a copy of "The Human Factory"
$1.00

AMERICAN MEDICAL ASSOCIATION
535 N. Dearborn, Chicago
Enclosed find $1.00 for which send me HYGEIA six months and a HUMAN FACTORY chart according to the special "Get Acquainted" offer.
Name .....Na-j
Address .....

Trade Mark Registered

Are Your Plants Infested by Bugs?

IF your plants, flowers, shrubs or evergreens are troubled in this respect, spray them frequently with Wilson's O. K. Plant Spray . . . Nationally recognized as the standard insecticide for destroying all the common insect pests. Very easy to apply . . . clean . . . harmless to humans. Recommended by the Officers of The Garden Club of America. Order a supply now . . . Half-Pint 40c; Quart $1.00; Gallon $3.00; 5 Gallons $12.00; 10 Gallons $20.00.

FOR SALE BY ALL DEALERS

Also Manufacturers of
WILSON'S SCALE-O
The Effective Dormant Spray
WILSON'S RHODY LIFE
For Rhododendrons

Andrew Wilson INC.
Dept. V1
SPRINGFIELD, NEW JERSEY

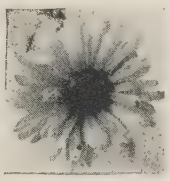
Free

40-page book that answers questions of gardening in simplest way.

FACTS that you always wanted to know—how to plan garden to make it a neighborhood gem, raise prize blossoms, have blooms all summer, overcome insects and diseases, etc. Prepared by garden authority familiar with your problems. Illustrated. Will help you improve any garden. Sent free.

108-page General Catalogue
Flowers—Vegetables

Nearly 4,000 varieties listed—seeds and plants—all the usual kinds and many rare sorts, such as Poppy Flowered Anemones shown here. Growing habits, hardiest and most prolific varieties clearly pointed out. Instructions for planting, tending and securing most favorable results. Write for free copy.



Poppy-Flowered Anemone

JOSEPH HARRIS CO., INC.
R. D. Box 26 Coldwater, N. Y.

Harris GERMINATION PROVED Seeds

SHRUBS . . .
BIG Bargains!
Persian Lilac 3'
Hydrangea P.G.2-3'
Ninebark Physoc. 4'
95 Guaranteed superior quality. Prepaid.

Young's Aurora Nurseries
AURORA ILL.
Catalog FREE

4 Canterbury Bells
4 Hardy Pinks, Asst.
4 L. S. Columbines
—regular price, $3—a full dozen gorgeous bloomers, by parcel post prepaid. *Order early. Address Dept. B*
$1.95

PERENNIALS

Nature Education

The Live Oak, a California Nature publication dedicated to the help of teachers and students, and one of the most vigorous and likeable publications on the West Coast, editorially reveals its faith in Nature Education. We submit it as one of the best and clearest statements on the subject:

"The greatness of the American nation is largely due to the Nature contacts of her people. We have grown up on a wild, free soil, unfettered by the stagnating influences of traditional culture. Inspired by the freedom of the wild, we have developed an initiative and independence of action unknown in history. Challenged by the hardships of pioneer life, the founders of our nation learned to endure privations, to persevere in spite of handicaps, and to build a solid, practical economic and social structure that is today world-renowned. The contacts of our forefathers with the perils of the wild developed in them those elements of character that have made America great.

"If the initiative, independence, and integrity of our people are to be preserved, we must in some way help our youth to love and appreciate the world of Nature. They must be interested in the forest life, must come to know the secrets of bird life, must love the simple beauty of the wild flowers. In this way they may find in their lives the same refining, invigorating influences that were enjoyed by their fathers. Only by Nature contacts can they be saved from the softening of moral fiber that is the sure result continuous subjection to the influence of the artificial life of civilization.

"In its spiritual influences, Nature plays its greatest benefit. Free from the prejudices and creeds of human interpretation, it speaks a language of universal appeal. Revealing the wisdom of the Infinite, it teaches man the value of higher things. In itself it leads the mind away from all that is low and tawdry; it appeals to the deepest instincts of integrity and uprightness, and by its quiet, simple beauty, it reveals the true greatness of simplicity. Unconsciously the Nature student grows to appreciate the value of a noble character, and by contact with Nature he learns those elements that make his life fragrant with the graces of a high spiritual life.

"It is a remarkable fact that great naturalists are always men of true refinement, gentleness of character, deep sympathies, clean lives, and profound spiritual vision. The daily contemplation of Nature has wrought into their lives all those qualities that we so much admire. Surely these same influences ought to be made available to the children and youth of today, if we hope to develop in them the fundamental principles that make for strength of character."

Winter Camping

All the summer comforts of camping are embodied in the new $10,000 winter camp grounds on the north side of Yosemite Valley in Yosemite National Park according to the Park Service. It is located not far from Yosemite Lodge, in the "sunshine belt," and with easy access to the toboggan slides, ice skating rink, and lodge cafeteria, in a spot much warmer than the others. Travel in Yosemite has increased twenty-three percent since October 1 over the same period last year, and it is expected that the new camp will bring a record attendance this winter.

ROSE DAPHNE
(*Daphne Cneorum*)

A most remarkable little evergreen shrub rapidly endearing itself to American plant lovers. Covered in May and again in October with delightfully fragrant clusters of pink flowers. We have a fine supply available.

	Ea.	10	100
8 to 10 inch plants, with ball of earth	.85	8.00	75.00
10 to 12 inch plants, with ball of earth	1.25	12.00	100.00

Less 10% if ordered and paid for before March first. Our new catalog of Flowers, Ferns, Evergreens, Trees, Shrubs and Fruits will be sent free if you wish it.

GEORGE D. AIKEN
Box Z, Putney, Vermont
"Grown in Vermont. It's Hardy"

The Most Beautiful SEED CATALOG

This seed catalog, unlike others, is a beautifully illustrated magazine on home gardening, the culmination of 54 years of thoughtful service to American home gardeners.

VAUGHAN'S GARDENING ILLUSTRATED
Contains the most complete collection of correct illustrations of annual flowers in true colors ever published in an American Seed Catalog. Also many inspirational

ARTICLES BY EXPERTS
on latest fashions and discoveries in gardening. Special 1930 offer: Cynoglossum Amabile, new Chinese Forget-Me-Not annual, pkt. 10c. Catalog sent with seed or alone, free.

VAUGHAN'S SEED STORE, Dept. 16
47 Barclay St., New York City 10 W. Randolph St., Chicago

SHUMWAY'S
Good Seeds
produce Flowers and Vegetables of Superior Quality

New crop, tested seeds, grown from the finest selected stocks—sure, vigorous producers.

For 60 years satisfied customers have bought Shumway's Good Seeds at reasonable prices and received the desired results.

FREE—Large catalog with hundreds of pictures of vegetables and flowers. Send your own and neighbors' addresses *today.*

R. H. SHUMWAY
121 S. First St., Rockford, Ill.

"Speed Without Noise"

A New Thrill!
on these
Rubber Tire Skates

Yes! **"CHICAGO"** Skates have broken World Records. The hard composition Rubber Tires outwear Steel Wheels 2 to 1. The Ball-Bearing wheels spin 10 times longer. Get a New Thrill. *Speed Without Noise.*

Champions prefer "CHICAGO" Skates--the best and *Guaranteed*. No. 181 Combination Super Skate for Boys, Girls and Grownups, price $4.00. From dealers or sent direct (*Postpaid*) for price and dealer's name.

OUTWEAR STEEL WHEELS 2 to 1

WHEELS SPIN 10 TIMES LONGER

FREE BOOK and PIN
Join "Roll on Rubber" Club

Get Book "How to Roller Skate". Membership Certificate and **Gold** finish skate pin. Send dealer's name and 10c to cover postage. *Write today.*

CHICAGO ROLLER SKATE CO.
Established Over ¼ Century
4451 W. Lake St., Chicago, Ill.

"CHICAGO"
TRADE MARK REG. U.S. PAT. OFF.
Rubber Tire Roller Skates
"Speed Without Noise"

EVERYONE IS SKIING!

WHEREVER snow flies, you'll see skiers on the hills. And 90% of them are using

NORTHLAND SKIS

National Champions and World's Champion jumpers are 100% for these fast, finely-designed record-makers. The famous deerhead trademark identifies them.

Ask for booklet, "How to Ski".

NORTHLAND SKI MFG. CO.
World's Largest Ski Mfrs.
82 Merriam Pk., St. Paul, Minn.

DIRECT from the native weavers . . . *Homespun Fringed Slumber Throw*

Luxurious masterpieces in wool — *at surprising savings.* Latest offering of the native Vermont woolcrafters in the popular homespun weave of purest virgin wool. Just the touch to lend new charm to the Boudoir, the Lounge, Sleeping Porch, Living Room or Den. Full-fringed at both ends; size 60" x 72". Mailed to any address for only $7.50, postpaid. Not sold in stores. Your choice of Gold, Green, Rose, Orchid, Blue. Satisfaction guaranteed. *Send for handsome catalog of woolen wares of heirloom quality.*

$7.50 POSTPAID

Vermont Natives Industries, Shop D, Bridgewater, Vt.

THE OCEAN RIVER

(*Continued from page 92*)

make a complete circuit of the ocean.

As long ago as the year 1846 an Englishman, Colonel Sabine, suggested the taking of regular observations of the strength of the current in the Straits of Florida as a possible means of anticipating weather conditions in the Old World. It is interesting to recall this suggestion at the present time when, through the enterprise of Professor C. F. Brooks and the American Meteorological Society, an effort is being made to get accurate records of the amount of heat transported daily through the Straits by the Gulf Stream water. The temperature of the latter is measured regularly by observers on the car ferries plying between Key West and Havana, and the speed of the current is determined approximately from the plotted drift of the ferries. Meanwhile several vessels following routes that cross the Gulf Stream farther north are obtaining detailed cross-sections of its temperature by means of sea thermographs, which make continuous automatic records and daily measurements with ordinary water thermometers are made at many other points; so that a good beginning has now been made toward "budgeting" the heat supply of this famous ocean river.

For Rose Growers

How to Grow Roses is a book of long and popular standing in the field of horticultural literature and there now comes to hand this volume in its seventeenth edition, enlarged in size and entirely rewritten. Its authors are Robert Pyle, J. Horace McFarland and G. A. Stevens. So thoroughly established is this book that it is hardly needful to say that it should be in every rose grower's library. It is published by Macmillan and sells for two dollars.

Carelessness Strikes

Forest fires, a large percentage of them caused by carelessness, stalked over the land last summer and took fourteen employees of the Forest Service, as well as many lives of private citizens. These fourteen lives were snuffed out in battling flames in many cases caused by a dropped match or cigarette, or someone's logging engine being run without a spark arrester. The North Pacific District, which was ablaze most of the summer, due to the excessive dryness, took a toll of six lives, while the Northern District, Montana and Idaho, reports four deaths. The past season recorded many brave deeds and acts of personal sacrifice and coolness, and heroism was as prevalent as if the men had been under fire. That such men should be offered up on the altar of human carelessness is much more deplorable than the loss of millions of dollars caused by people who just "didn't think."

VICTOR Portable STEREOPTICON

Has established the world wide standard of Projection Excellence

SLIDES MADE-TO-ORDER FROM YOUR BEST PICTURES (Negatives or Prints)

Victor Animatograph Co.
299 Victor Bldg.,
Davenport, Iowa.

WRITE FOR **SPECIAL EASY TERMS**

WHEN THEY PROSPECT FOR GOLD IN THE NORTH COUNTRY

WILD COUNTRY — merciless to men and equipment. Where prospectors seek for gold. Where you find "Old Town Canoes." For there a canoe must shoot rapids — bump against jutting rocks — and slide along like an Indian birch-bark. "Old Towns" are patterned from Indian models . . . made extra strong to stand up under all sorts of rough handling.

Go partners with your pal on an "Old Town." They're as low as $67. Free catalog shows paddling, sailing, and square-stern models. With sponsons if you like. Also shows rowboats; dinghies; big, fast, seaworthy, outboard, all-wood family boats, and speedy step-planes. Write today. Old Town Canoe Co., 182 Main St., Old Town, Maine.

"Old Town Canoes"

MIRAKEL
BINOCULARS COVER THE WORLD

OVER THE ARCTIC AND THE ANTARCTIC
with
Commander Richard Byrd and Capt. Sir Hubert Wilkins
UP THE AMAZON
with
J. Bequaert School of Tropical Medicine
THRU THE GOBI DESERT
with
Roy C. Andrews

Carried around the World by The Graf Zeppelin

Used the world over by Naturalists, Scientists and those who demand

PROVEN QUALITY

5 X.....$25.00
7 X.....$35.00
Sport Model.....$16.50

Write
Mirakel Distributors
1214 16th Street, N. W.
Washington, D. C.

Used & New Field Glasses

Pocket size prisms in 5½, 4, 5, 6, 7 & 8 power, 3 to 12 oz. weight; $13 to $35. Zeiss, Hensoldt (including "Dialyt"), Mirakel, Busch, Schutz, Lemaire, Atco, Colmont and Megaphos, Galilean or "field glasses" $3 and upward. **Satisfaction guaranteed.** Sent on approval.

J. ALDEN LORING
Box K O-we-go, N. Y.

NATURE IN PRINT

Evolution Again

Popularly-presented books on evolution are becoming interesting to publishers, the last to come to our attention being *The Story of Evolution* by Benjamin C. Gruenberg. The author states that it is not the purpose of his volume to prove or disprove "evolution," that noun with so many connotations and which to the ill-informed means only that man is supposed to be descended from the monkey. What Dr. Gruenberg is concerned with in his book is "the process whereby the stream of life continues down the ages to manifest itself through new individuals that differ from one another and that form constantly changing groups of species." He has gathered together the data, presented the various theories and proved facts in attractive style and has turned out a volume of interest to those who wish to think. D. Van Nostrand are the publishers and the book sells for three dollars.

* * *

An Understanding Book

"Wherever there are animals I find happiness and peace," is the first sentence in Paul Eipper's book, *Animals Looking At You*. The author has been a patron of the zoological parks and the circus menageries all his life and has studied and watched animals in captivity. From out of these years with his hobby he has taken many entertaining and interesting experiences and anecdotes and assembled them at random in one book which has been popular in Germany and is now appearing in ten different languages. It is brought out in this country by the Viking Press and sells for three dollars.

* * *

About Perennials

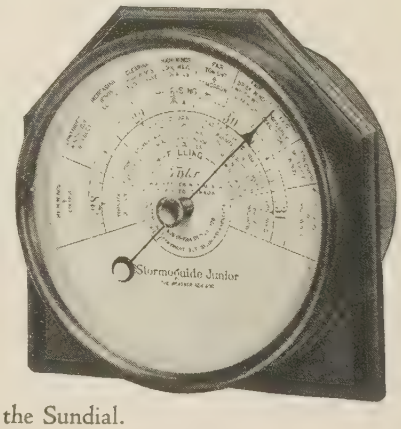
With our northern gardens dormant at this time of year *Perennials of Flowerland* by Alice T. A. Quackenbush is a particularly happy book to turn to. Many will soon be planning their 1930 gardens and poring over the catalog, and this book will be a mighty handy one to have at one's elbow while engaged in this fascinating task. The author gives advice on both selection and care of the perennials. It is published by the Macmillan Company and sells for $1.50. It is listed on our book page.

* * *

Barro Colorado

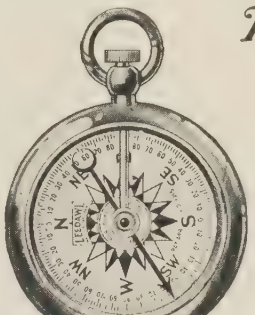
In the January issue of Nature Magazine Dr. Alfred O. Gross wrote of Barro Colorado Island in the Panama Canal Zone. Undoubtedly the necessarily brief article whetted many appetites for more about this sanctuary of the tropics. These appetites will be thoroughly satisfied by acquiring *My Tropical Air Castle* by Frank M. Chapman, Curator of Birds of the American Museum of Natural History. Dr. Chapman confesses in his preface that, since boyhood, he has always cherished a passion for the tropics, and he gives to this story of what he saw at Barro Colorado, therefore, the full benefit of his lifelong enthusiasm. This

Taylor Stormoguide Jr.



does not control the weather but forecasts the kind of weather to prevail 12 to 24 hours hence and does so with high average accuracy; enables you to plan your work, or your pleasures, to organize every phase of your everyday life so you can take advantage of all kinds of weather, good or bad.

The *Taylor* Stormoguide is more than an ordinary Barometer. Its convenience in reading is as marked as the convenience of telling time by the clock as compared to the Sundial. Stormoguide Junior has 4½ inch white finish dial, walnut finish bakelite case, good grade aneroid movement, adjustable for altitudes 0 to 2500 feet. Price $10.



Taylor Compasses

are fine instruments of American manufacture, meeting the needs of sportsmen or hunters. Models to fit any requirements. Open face or hunter cases, bar needle or floating dial types. Every *Taylor* compass has jewelled pivot.

The compass at left is a *Taylor* Leedawl. It has untarnishable silvered metal dial, heavy tempered steel point on which the needle operates; screwed top (no dirt or moisture can get inside with this style of top) white metal case, snap in beveled crystal glass, open face.

Price Each $1.50

Your dealer has these Taylor Instruments. He will be glad to show them to you. If remote from dealer, we will send direct upon receipt of price.

Taylor Instrument Companies

ROCHESTER, N. Y., U. S. A.

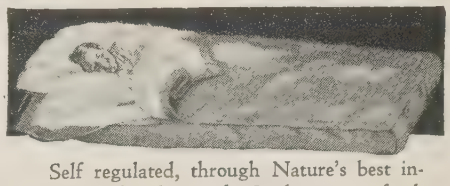
CANADIAN PLANT
TYCOS BUILDING
TORONTO

MANUFACTURING DISTRIBUTORS
IN GREAT BRITAIN
SHORT & MASON, LTD., LONDON

WOODS ARCTIC DOWN SLEEPING ROBES

"A good warm bed and a good old world"

You SLEEP and REST



THERE is the hum of the bees in a blooming basswood tree—the sweet aroma of the honey-laden blossoms. Yet at bedtime, by both the calendar and the thermometer it was midwinter. Dream on! Your Woods Arctic Down Sleeping Robe will keep you in that same delightful state of comfort.

Anywhere, from an outdoor bivouac in the wilds to a sleeping porch atop a city skyscraper. Real *sleep* and *rest* regardless of the weather.

Self regulated, through Nature's best insulation, the down of Northern waterfowl. Uniform thickness of soft, fluffy down everywhere—over, under and all about you. Lining is finest obtainable pure virgin wool kersey. The world's warmest yet lightest self-regulating outdoor sleeping robe.

Sold by leading dealers. If not displayed, please write to us. Folders giving full details and prices sent FREE.

Woods Manufacturing Co., Ltd. 3012 Lake St., Ogdensburg, N. Y. In Canada, Ottawa, Ont.

SEND FOR "ON WESTERN TRAILS" BEFORE MAKING YOUR VACATION PLANS FOR 1930

NATURE BOOKS

That Win Young Minds

WRITTEN BY
CHARLES LINCOLN EDWARDS, Ph. D.

who for the past eighteen years has supervised Nature study in the Los Angeles city school system

Nature Study as scientifically correct as a university course told graphically in clear, vivid, understandable language that fascinates children.

■

NATURE STUDY
IN TWO PARTS
Price $1.50, each

■

BOOKLETS

"Story of the Earth" "Mammals" "Birds" "Lizards" "Insects"
Each 25c

■

STORIES

"Jim and Tim." "Big Bill and Little Billie. A Story of the Overland Trail and the Forty-Niners." "A Story of the Colorado Desert," "Jack and Jill and Indian John, a Chumash Chief."
Price 25c each

HESPERIAN PRESS
2476 Glendower Place
Los Angeles, California

is a charmingly written and thoroughly illustrated volume of fascinating and, to us, exotic wild life. However much we may wish to know and study the flora and fauna that is around us, most of us also delight in reading of that which is different and far removed. This volume sells for five dollars and is published by Appleton. It is listed on our book page.

* * *

Also Received

Thought-Study Reader, Book V., by Paul R. Spencer, Roma Gans and Lois Duffin Fritschler. A school reader designed to be interesting reading and at the same time provocative of thought. Lyons and Carnahan.

New Laboratory Experiments in Practical Physics, By N. Henry Black. Revised edition of a good physics textbook. The Macmillan Company. $1.12.

Cement by Henry W. Nichols. The history of the discovery of cement and what it means to the world. Field Museum of Natural History. $.25.

Neanderthal Man by Oliver C. Farrington and Henry Field. The story of this primitive race of antiquity. Field Museum of Natural History. $.25.

Tropical Trees of Florida by Nellie Irene Stevenson. Small, illustrated booklet on tropical trees in Florida. Published by the author, at Fayette, Iowa.

Woodpeckers, Nuthatches and Creepers of New Jersey by Dr. Leon Augustus Hausman. Bulletin 470 of the New Jersey agricultural Experiment Station.

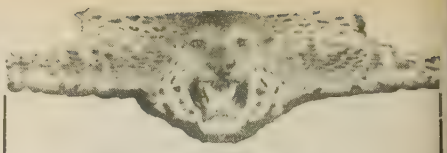
Test Your Soil For Acidity by C. M. Linsley and F. C. Bauer. Circular 346 of the College of Agriculture and Agricultural Experiment Station, University of Illinois.

* * *

Research Vindicated

Many are the volumes, pamphlets and other publications setting forth the results of research that come across our desk. Some bear imposing titles and deal with unpronounceable species of little-known insects, fish and the like. But the latest fruit of exhaustive research to reach us is a little green book with the title, *The Golpher.* It turns out to be the findings of the Mashie Niblick Research Foundation, compiled and prepared for public view and reading by Russ Edwards (sh! Russ Edwards is our Director of Educational Publicity and looks up on every third shot). The Foundation has attacked this problem and sought, rather successfully we feel, to get at the root of this golf matter and to find out what makes the golfer tick. A review of this book may not be technically legitimate for our Nature in Print columns but it certainly is next to Nature and there is a lot of human Nature in it. Just in case you want to see that a golf nut in your family or elsewhere gets this book,—or maybe you are one of them,—you can facilitate it by sending a dollar to the Fireside Golphers, Suite 32 at 930 H St., N. W., Washington, D. C.

USE NATURE MAGAZINE ADVERTISING COLUMNS TO SUPPLY YOUR NEEDS



Fur Rugs

Mounted Birds and Animals

Jonas Bros.' Rug and Trophy Catalogs illustrate Beautiful Rugs of Leopard (like engraving above), Tiger, Mountain Lion, Bear of many kinds; and Mounted Heads of Deer, Elk, Buffalo, etc.; also Mounted Birds. Specimens sent on approval to responsible persons.

Master Taxidermists

1023 Broadway — JONAS BROS. — Denver Colorado

CANADA TAX SALE

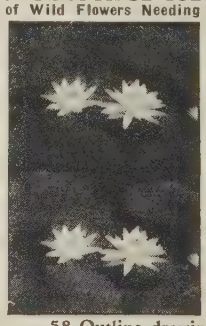
SEIZED AND SOLD FOR TAXES

$76.00 buys 250 feet lake front
$153.00 buys 99 acres Ontario
$180.00 buys 100 acres Fur Farm
$202.00 buys 35 acres Muskoka lake-front
$396.00 buys 100 acres House and Barn
$450.00 buys 300 acres game preserve

These properties, with several hundred others, are offered at the prices stated, no mortgage, no further payments. Beautifully situated hunting camps and fishing lodges where there is real hunting and fishing. Summer cottage sites; heavily wooded acreages situated in Muskoka, Highlands of Ontario, and the New North; also farms in old Ontario, Quebec, Prairie Provinces and British Columbia. Our 13th annual list just issued in the form of a twenty-page illustrated booklet, describes these properties and gives full particulars. It is mailed free on application. Now is the time to invest in Canada's minerals, forests and farms. Don't delay. These properties won't last at these prices. Send no money but send for booklet to-day, so you will have first choice.

TAX SALE SERVICE
Room 615
72 Queen Street West — Toronto 2, Canada

36 BEAUTIFUL COLORED POST CARDS
of Wild Flowers Needing Protection. 25c per doz.



11 Wild Flower Films
35 and 16 mm.
Rented $1.25 up.
Sold $7.50 up.
List on request

Colored Slides
of flowers, orchids and ferns with printed lectures
rented $5.00 postpaid
sold $60.00

58 Outline drawings of Flowers for coloring 12c per doz., 75c per 100

For other details write to
WILD FLOWER PRESERVATION SOCIETY
3740 Oliver St. — Washington, D. C.

Mount Birds

Learn at Home by Mail Be a taxidermist. Learn to mount BIRDS, ANIMALS, GAME HEADS, FISH. Wonderful fascinating new art. All secrets revealed. Easily, quickly learned by men, women and boys. Decorate home and den with nature's finest art. SPORTSMEN save your trophies. BIG PROFITS for spare time. Sell your mounted specimens and mount for others. Have a business of your own. Big demand, high prices. Learn from old reliable school, 20 years' experience.

FREE! Beautiful illustrated book, "How to Learn to Mount Game", with dozens of photos of mounted specimens. Yours for the asking — FREE — Write Today. Taxidermy is a NECESSITY for sportsmen and nature lovers — INVESTIGATE. Get this wonderful FREE BOOK NOW — no obligations. Write! Don't delay. Send Coupon Today—NOW!

FREE BOOK COUPON

N. W. School of Taxidermy
2942 Elwood Bldg., Omaha, Neb.
Send me your free illustrated book "How to Mount Game." Also tell me how I may learn this fascinating art easily and quickly by mail. No obligation.

Name _____

Address _____

FREE 10 DAYS TRIAL

Patented **INKOGRAPH** Trade Mark Reg.

PENCIL POINTED FOUNTAIN PEN

A New Idea a distinctly different self-filling fountain pen that writes with ink like a pencil. It does any kind of writing—instantly—on any kind of paper, ***even wrapping paper.*** Better. Smoother. Without a miss, skip or blur. Has the advantage of a pen and the ease of a pencil.

FRANKLIN SURETY CO. Assets over $1,000,000. GUARANTEES fulfillment of all promises made in this AD.

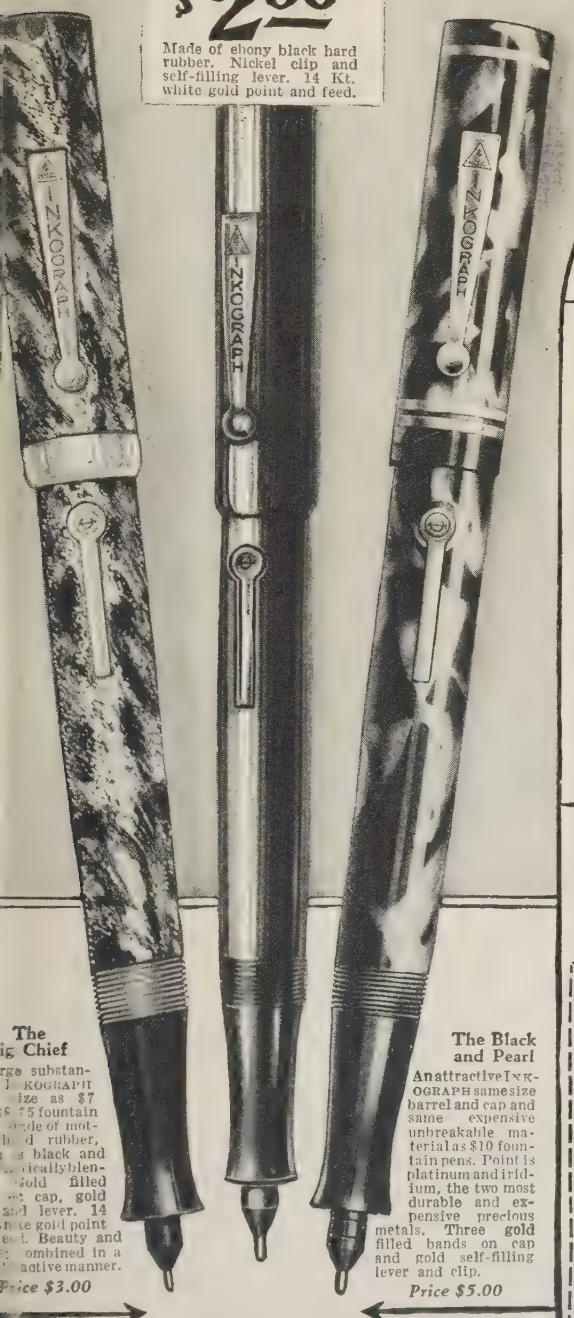
It works like a charm—with a light, smooth easy glide that ***actually*** improves your handwriting.

Makes 1 to 4 clear carbon copies and your originals in ***ink.*** Ideal for salesman's orders, private correspondence, office, sales, billing or other records.

Draws lines to a ruler. Not a smudge or blot. The hard smooth ball-like point cannot spread, bend or break. ***Let anyone use it.*** They cannot injure or distort it. A patent automatic feed prevents point from clogging. ***And it never leaks.*** Beautifully made of finest materials. Has safety screw cap, self-filling lever and clip. It is the equal of pens selling at a much higher price, and it's FREE to try for 10 days. No obligations. Simply send the coupon along.

$2.00

Made of ebony black hard rubber. Nickel clip and self-filling lever. 14 Kt. white gold point and feed.



The ig Chief

rge substan- INKOGRAPH ize as $7 $5.75 fountain cle of mot- hard rubber, s black and ically blen- old filled cap, gold and lever. 14 te gold point ed. Beauty and combined in a active manner.

Price $3.00

The Black and Pearl

An attractive INKOGRAPH same size barrel and cap and same expensive unbreakable material as $10 fountain pens. Point is platinum and iridium, the two most durable and expensive precious metals. Three gold filled bands on cap and gold self-filling lever and clip.

Price $5.00

Illustrations Actual Size

WHAT THEY SAY OF IT!

I have been Money Order Clerk in the P. O. for twenty years and this is the best pen I have ever used.—*John O. Fulenwider, Monroe, North Carolina.*

Your Inkograph is a delightful surprise. The touch is velvety, the flow smooth and its performance altogether satisfactory.—*Sidney Adams, Rock Hill, South Carolina.*

You have one of the best writing instruments I ever used regardless of price, I use the lowest grade stationery and there is never a blotch or scratch because of its round smooth point. It is a wonderful invention.—*H. L. Orley, Albano, Va.*

Am a bank teller. Can pick up Inkograph any time in any position it writes immediately all words and numbers the same. Try and do it with any other pen. Can honestly say I never found a pen so easy and tireless to write with.—*C. R. Morely, Allentown, Pa.*

Am tickled skinny. It's a darling, can make carbon copies of orders and send original in ink to factory instead of penciled sheet.—*A. Watson, Elgin, Ill.*

I am determined to use no other pen in my work. If they only knew the comfort of writing with this pen, every author in the world would, I am sure, get one. "Cheerio."—*Count Louis Hamon, London, England.*

Eight years or more ago, I purchased an Inkograph, which has been in almost constant use during that time. This is rather remarkable, inasmuch as I had many fountain pens from cheap to expensive, but none compares with the Inkograph which is as good and ready to serve as when I purchased it.—*Harrie Baxter, Great Neck, L. I.*

Writes smoothly, like point was greased. Makes no difference what kind of paper. Fine for shipping tags.—*E. A. Simms, Jersey City, N. J.*

I must write and express my appreciation to thank you for giving the public the opportunity to use so wonderful a writing instrument. In my own work, inventing, I must jot down my thoughts and ideas very quick and I find my Inkograph my first aid, which never fails.—*B. L. Henry (Lady Edison), New York*

Have improved 50% in my hand writing since using your Inkograph.—*J. R. Reed, Louisville, Ky.*

You can see the point in it for insurance men—for you can spread this news but not that point.—*George E. Miller, West Philadelphia, Pa.*

In my opinion there isn't a better pen on the market regardless of price.—*D. J. Bergeron, Lafayette, La.*

We intend to use the Inkograph generally in the office. It makes a splendid carbon on 20 lb. paper.—*Bernard Gloekler Company, Pittsburgh, Pa.*

Take Advantage of Our FREE 10 Days' Trial Offer

and join the many thousands who tell us that regardless of price the INKOGRAPH is the best writing instrument they have ever used.

INKOGRAPH COMPANY, Inc.

World's Largest Pencil Pointed Fountain Pen Manufacturers

161-159 Centre St., New York, N. Y.

DEALERS

Stationery Stores, Drug Stores, Department Stores, etc., send for our catalog and trade prices.

SEND NO MONEY Your name and address are sufficient. If within 10 days you are not entirely satisfied that the INKOGRAPH is the handiest and smoothest pen you have ever used regardless of price, return it and we will refund your money.

When Ordering Inkograph Put X After Style Desired

$2.00 ☐ Also mark X Here ☐ if you prefer ladies' size with ring on cap to be carried on ladies' sautoir or man's watch chain.

$3.00 ☐

$5.00 ☐

AGENTS

Send for INKOGRAPH or FREE sales plan booklet. Sells on sight, no investment, immediate commissions.

NOTE: When remittance accompanies order INKOGRAPH will be sent postpaid. Prices outside U. S. A., $2.00 styles, $2.50; $3.00 styles, $4.00; $5.00 styles, $7.00 and remittance must accompany order.

INKOGRAPH CO., Inc., 161-159 Centre St., New York

You may send me INKOGRAPH, I will pay postman $ plus postage on delivery.

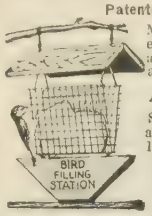
Name _____

Address _____

City _____ *State* _____

BIRD FILLING STATIONS

Patented July 13, 1926



Make fine presents for BIRDS and FRIENDS alike.

AUTOMATIC

Suet always clean and accessible to last particle.

Feed the Birds and keep them with you. Every home should have several.

Postage Paid

No. 1, price $1.50 No. 1 to hang from tree or bracket.

No. 2, price $1.25 For window casings, porch columns, etc.

LEWIS P. KELLY, R. F. D. 4, Dept. N, Peoria, Ill.

SAVE THE SONG BIRDS

With My **2-in-1 Bird Feeders**

A Feeder in the Winter
A Wren House in Summer

$2.50 POSTPAID

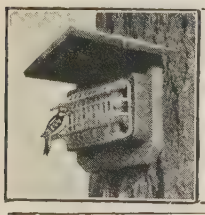
Send for literature on Bird Houses, Bird Baths, Weather Vanes, Sun Dials, Gazing Globes and Garden Ornaments.

Roderick Payne, Inc., *"The Bird House Man"*
Box 495 Springfield, Ohio

Rustic White Cedar, Woodpecker, Bluebird, Wren —3 Houses $3.95. Delivered by prepaid Parcel Post —East Miss.

Catalog on Rustic Fences and Furniture

New Jersey Fence Co., Burlington, N. J.



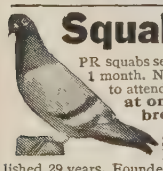
The Perfect Bird Feeder

This Feeder protects suet and other forms of bird food from weather and waste. Attractive to birds, artistic in appearance, durable, and easily filled. Can be attached to a tree or some part of a building.

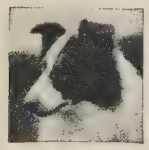
Price $1.50, postage prepaid.

GLADSTONE CALIFF.
1136 N. 8th St., Quincy, Ill.

Squab Book FREE



PR squabs selling by millions to rich trade. Raised in 1 month. No mixing feed, no night labor, no young to attend. Sell for double chicken prices. **Write at once** for free 48-p. book telling **how to breed** and profit by **new fast sales method. PLYMOUTH ROCK SQUAB CO., 704 H St., Melrose Highlands, Massachusetts.** Established 29 years. Founder of the squab industry. Largest business in the world in pigeons and pigeon supplies. Reference, any bank. We ship breeding stock everywhere on three months' trial.



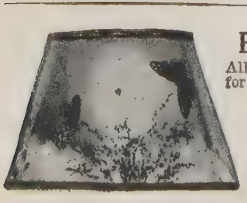
WHITE COLLIE pups, the most beautiful specimens the dog world can offer, useful and intelligent. Send for Catalogue.

Comrade Farm Kennels, Galion, Ohio

Rough and Polished Minerals

We are dealers in minerals and polished semi-precious stones catering only to those who are interested as collectors, students, teachers, naturalists, curators or craft workers. We try to stock all varieties of polished semi-precious stones, genuine mined material only and correctly classified. Price lists, circulars and approval blank upon request.

The Gem Shop, Box 380, Wolf Creek, Montana



Butterfly Shades

All materials and directions for making this Exquisite Shade —12" **$5.00**

Price made up—$12.50

BUTTERFLY BOX
63 Franklin St.,
BOSTON - MASS.

Send for Circular showing complete line

Bluebird or Bunting?

The State of Colorado is discussing birds, —which is fine. The people are being called upon to consider which is the most appropriate bird for selection as the official State Bird. There appear to be two main contestants for the honor,—the bluebird and the lark bunting. It is a question which the Legislature of the State will be called upon to decide on the basis of expressed public opinion. It appears that the bluebird has a large number of supporters, as might be expected with a bird of such loveliness. It appears, also, that the lark bunting is gaining more and more friends, as might likewise be expected with a bird of such beauty of plumage and flight, such joy of song and such distinction. In fact the greatest strength in the argument for the bunting lies in the fact that it is much more distinctively a Colorado bird than is the bluebird, which has already been selected to serve as the State Bird of other States. Of course the bluebird considered is the Mountain Bluebird, which seems also to argue in favor of the bunting, a bird of more general distribution throughout the State. The selection of a State Bird is Colorado's own affair and one in which we have interest but not influence. We hope that there will be free and full discussion, because through this means will be aroused interest in birds generally, and we hope that whichever bird Colorado may select it will be chosen through the expression of widespread opinion.

Virginia Bird Lovers

Nature lovers in Virginia will be interested to hear of the formation of the Virginia Ornithologists Society which came into being at a meeting of a score of interested people at Lynchburg College, Lynchburg, Virginia. Professor Ruskin S. Freer of the College faculty was chosen as president of the infant organization. It is planned to form divisional groups under the general head of the society. President Freer states that while the main aim of the society is for the advancement of the study of birds and for working with ornithologists in other states, the scope of its work will include the teaching of conservation of wild bird life and educational work on the economic and esthetic values of birds All interested Virginians should get in touch with Professor Freer.

Golfers Attention

When snow blankets the fairways and the sand traps look less forbidding as mounds of white, there are still birdies on the golf course. They are not, however, run up shots that pop into the cup or long rolling putts but the real birds around the course. The National Association of Audubon Societies has a Golf Club Bird Sanctuary Committee which includes in its membership one Robert T. Jones, Jr., well-known authority on birdies even though not in the ornithological sense. This committee has issued a call to

MONEY IN RABBITS

Silver Black Fox—English Angora Woolers

Other leading fur breeds. 16 page catalogue of breeds, management hutches, etc. Shows real opportunities in fur farming. *Catalogue 10c.*

RANSOM FUR FARM **GENEVA, OHIO**

FEED the BIRDS

Use the **Packard Automatic Feeder.**

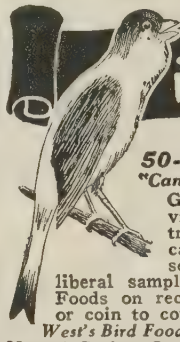
Keeps food dry, avoids waste, holds a quart, weighs (packed) 3 pounds, and costs $1 and postage. Why pay more?

Special Mixture Bird Food

Balanced ration. Nothing else like it: nothing else so good. 10 pounds, $2 and postage.

Everything For Wild Birds
Catalogue Free

WINTHROP PACKARD
1433 Washington Street Canton, Mass.



BIRD LOVERS Free

50-Page Bird Book in Colors
"Canaries for Pleasure and Profit"

Gives expert professional advice on breeding, rearing, training, feeding and care of canaries. Keep your birds in song. Sent free together with liberal samples of West's Quality Bird Foods on receipt of 10 cents in stamps or coin to cover mailing cost.

West's Bird Foods are sold at all good stores

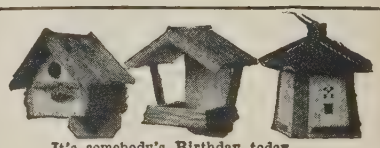
Magnesia Products Co., 1609 Hubbard St. Milwaukee, Wis.

CANARIES

Real bargains in carefully educated singing canaries. Marvelous **"California Beauties"** and imported **"German Rollers."** Low prices never before equalled on guaranteed stock. Buy from us. Be Safe. Save money.

FREE PET BOOK Tells all about these amazing values. Also Parrots, Gold Fish, Fancy Birds, Cages, Seeds, etc. Full of valuable information on care and breeding. Write now for this interesting, money saving FREE book.

CHICAGO BIRD & CAGE CO., 422 S. State Street Dept. 242, Chicago



It's somebody's Birthday today
3 for $5.00 and Post Charges

Crescent Co. *"Birdville"* Toms River, N. J.

ROBIN HOOD

Would have liked our new catalog "N" —send 4c. for it!

BOWS—ARROWS

Archery Outfits, and Raw Materials for those who prefer to make their own. Boomerangs, 22-inch beautiful bent ash, with instructions..... **$1.75**

L. E. STEMMLER CO. (Est. 1912) Queens Village, N. Y.

ROCKS *and* MINERALS

A 40 page-illustrated-quarterly magazine devoted to the fascinating study of minerals and their collecting. Subscription U. S. and Possessions $1 per year. Foreign $1.25. Sample copy 35c

A subscription makes one a member of the Rocks and Minerals Association.

ROCKS and MINERALS
Dept. N Peekskill, N. Y.

CALIFORNIA POSTAL CARDS

In rich colors. Mountains, Orange Groves, Beaches, Hollywood Studios, Old Missions, Ostrich Farm, Pepper Trees, Yucca Palms, Flowers. 12 Assorted 25 cents.

M. L. Armstrong, 401 So Olive, Los Angeles, Calif.

CALIFORNIA FRESH DATES

(Palm Ripened)

2¾ lbs. $1.60 delivery paid

GARDEN OF THE SETTING SUN
Dept. 19 Mecca, Calif.

golf clubs to consider their bird residents during the winter months and to provide much-needed food for them. The circular containing specific instructions for feeding points out that birds die in the winter not from cold but from lack of food. This circular can be obtained from the National Association of Audubon Societies, 1974 Broadway, New York.

Our Wild Orchids

One who loves orchids will go without a meal or two if necessary to add to his library *Our Wild Orchids* by Frank Morris and Edward A. Eames. Here is the story of some seventy-two species of orchids known to be native to the northeastern United States and Canada, west to Minnesota and south to Tennessee. It is not merely a listing and botanical description of these lovely plants because the authors have infused the volume with the spirit of the trail that is followed in search of the orchid. The book grows out of years of hunting and study and photography (the illustrations number 134, all full page and four in color) and is a volume for the future. There is, also, much more than mere orchid lore in the work, because other forms of wild flora and fauna met in the search for orchids are brought interestingly into the volume. The number of illustrations and quality of the book as a publisher's achievement make necessary the price of $7.50. The publishers are Charles Scribner's Sons.

Shelford on Ecology

In *Laboratory and Field Ecology* by V. E. Shelford, are presented the results of life studies in a state of nature, and in the laboratory where conditions simulating those of nature, but which can be controlled, have been maintained. Until comparatively lately field observations on animals were almost the only means of ascertaining their habits and life processes. The importance of field studies cannot be overestimated, but it is evident that they must sometimes be supplemented by experimentation under conditions where the quantity of food, the degree of temperature or humidity, or the chemical composition of the soil, may be measured accurately.

Ecological studies, the relations of communities of animals and plants to their environments, are of tremendous importance. When we consider the effects, for good or ill, that the codling moth, the potato beetle, the cornborer, the honey-bee, or the silkworm, exert on human activity, the desirability of learning as much as possible about the influence of food, temperature, humidity, soil and other factors on their growth, fecundity, longevity, hibernation, abundance and death rate, must be apparent. This book describes methods of procedure and equipment that aids in such studies. A bibliography of more than a thousand titles is an important feature of the work. The volume is from the press of Williams and Wilkins, Baltimore, Maryland; $10.00

FORESTS
AND
MANKIND

By
CHARLES LATHROP PACK
President of the American Tree Association
AND
TOM GILL
Forester

250 PAGES

64 ILLUSTRATIONS

. . . a book to own and to read time and time again by those who seek knowledge of the importance of the forests in their historical, social and economic relations to mankind.

Just Off the Press
Price $3.00

Order from
AMERICAN
NATURE ASSOCIATION
WASHINGTON, D. C.

ALLEGANY SCHOOL OF NATURAL HISTORY
The School in the Forest
Quaker Bridge, N. Y.
Fourth Season—July 5 to August 23, 1930

For field studies in Zoology, Botany, Geology, Natural History of Birds, and Nature Study, under most favorable conditions as to natural surroundings, laboratories, living conditions, climate, and professional guidance.

Sponsored by the *Buffalo Society of Natural Sciences*, the *New York State Museum*, and the *University of Buffalo* (with college credit).

For circular or registration, address, *until June 15:*
DR. ROBERT E. COKER, *Director*
CHAPEL HILL, N. C.

NATURE LORE
midst the quiet grandeur of the Alleghenies
The Pennsylvania State College
provides unusual opportunity to earn collegiate credit toward certification or a degree in its
NATURE CAMPS
First Camp June 26 to July 17, 1930
Second Camp July 16 to August 7, 1930
Intensive Field Work
Lectures by Prominent Authorities
Illustrated bulletin on request
PROFESSOR GEORGE R. GREEN
Director of Nature Camps State College, Pa.

Learn to be a—
LANDSCAPE ARCHITECT
At Home—By Mail

Big fees; pleasant healthful work; a dignified, uncrowded profession offering remarkable opportunities. Immediate income possible, many students more than pay for course from fees earned while studying. Graduates are earning $50 to $200 a week. The first step toward success is to write today for details.
AMERICAN
LANDSCAPE SCHOOL
Member National Home Study Council
21 Plymouth Bdg., Des Moines, Ia.

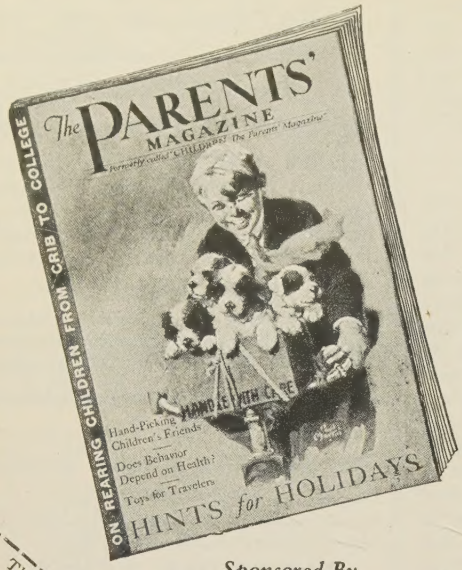
COLLEGE COURSES
AT HOME

Carry on your education. Develop power to initiate and achieve. Earn credit toward a Bachelor degree or Teaching Certificate *by correspondence*. Select from 450 courses in 45 subjects, including English, Mathematics, History, Education, Psychology, Economics, the Languages, etc. Write for catalog.
The University of Chicago
423 ELLIS HALL CHICAGO, ILL.

Learn Photography at HOME
Make money taking pictures. Prepare quickly during spare time. Also earn while you learn. No experience necessary. New easy method. Nothing else like it. Send at once for free book, *Opportunities in Modern Photography*, and full particulars.
AMERICAN SCHOOL OF PHOTOGRAPHY
Dept. 1602, 3601 Michigan Ave. Chicago, U. S. A.

CULTURED SPEECH
AT LAST! Something New!

Learn Cultured Speech and Correct Pronunciation quickly from phonograph records. Also increase your vocabulary this new easy way. Be a fluent talker—cultivated speech is a social and business asset of the first importance. This new "learn by listening" method highly recommended by leading educators. Records sent on free trial. Write for information and free Self Test. No obligation.
THE PRONUNCIPHONE INSTITUTE
3601 Michigan Ave., Dept. 1602 Chicago


The PARENTS' MAGAZINE
Formerly called "CHILDREN" the Parents' Magazine
ON REARING CHILDREN FROM CRIB TO COLLEGE
Hand-Picking Children's Friends
Does Behavior Depend on Health?
Toys for Travelers
HINTS for HOLIDAYS

Bring Up Your Child in the Best Possible Way

Here at last is a monthly magazine containing the most practical sort of advice on handling the thousand and one problems that arise in the rearing of your children from crib to college.

ALL mothers and fathers have problems of one sort or another with their children—problems of behavior, problems of likes and dislikes, school problems, problems of physical development, sex instruction, character building. And there is, of course, a right and a wrong way of handling each.

Yet how few parents realize that there has been in recent years a great deal of study of just these common difficulties, and that workable methods for handling them have been worked out—methods that have met with amazing success with hundreds of other children of all sorts and ages.

A Hundred Hints to Help You

Child rearing is no longer looked upon as something that parents come to know instinctively. Today's parent looks for sound counsel and expert guidance. Far less frequently does one hear such a remark as, "John has a terrible temper, but that's the way he is, and there's nothing to do about it." For we know that such things as temper, disobedience, selfishness and dozens of other qualities are not inherited at all. *There IS something to be done about them.*

The Parents' Magazine deals with facts. It helps you in your everyday job of preparing your children for a healthy, happy, successful life. It is human, live, easy to read, easy to understand and absolutely authoritative. Every line is useful to you as a practical mother or father—not only for the first few years of your child's life, but also at each important period of his or her development, from crib to college.

Mail Coupon For A Trial Year Today

Sponsored By Four Great Universities

The Parents' Magazine is published with the mutual cooperation of Teachers College, Columbia University; University of Minnesota; State University of Iowa; and Yale University.

The Parents' Magazine, 255 Fourth Ave., New York
Enter my name for (1) The Parents' Magazine for an entire year, and (2) 3 Extra Numbers to NEW subscribers, and (3) a copy of the Intelligence Test for Parents—ALL FOR $2.

Name .....
Street No. .....
City .....
State .....
N-2-30

INDEX TO ADVERTISERS IN FEBRUARY ISSUE

BINOCULARS
Bausch & Lomb Co. 66
Loring, J. A. 126
Mirakel Distributors 126

BIRD HOUSES
Califf, Gladstone 130
Crescent Co. 130
Kelly, Lewis P. 130
N. J. Fence Co. 130
Packard, Winthrop 130
Payne, Roderick Inc. 130

BOOKS
Audel, Theo. 124
Children, Parents' Magazine 132
Doubleday Doran & Co. 67
Encyclopaedia Britannica 65
Forests & Mankind 131
Hesperian Press 128
Hygeia, The Health Magazine 124
Nelson Doubleday 69

CAMPS
Pennsylvania State College 131

CHAMBER OF COMMERCE
Orange County Chamber of Commerce . . 68
Orlando Chamber of Commerce 68
West Palm Beach Chamber of Commerce . 68

EDUCATIONAL
American Institute of Psychology 71
American Landscape School 131
Allegany School of Natural History . . . 131
American School of Photography 131
Amorc College 70
University of Chicago 131

GARDEN SUPPLIES
American Farm Machine Co. 122
Iowa Mfg. Co. 122
Standard Engine Co. 124
Walsh Tractor Co. 124

GIFTS
Butterfly Box 130
Metal Arts Co. 130

HORTICULTURE
Aiken Nurseries 125
Allen, W. F. 124
Aquaproof Products Co. 124
Arlington Waterlily Gardens 122
Bassi Frères 119
Burgess Seed & Plant Co. 122
Burpee, W. Atlee & Co. 121
Buskirk's Independence Nurseries . . . 120
Conard-Pyle Co. 123
D. Hill Nursery Co. 118
Dingee & Conard Co. 124
Dingee & Conard Co. 122
Dreer, Henry A. 117
Gillett's Fern & Flower Farm 119
Gillet, H. M. 121
Green's Nurseries 124
Haines, Charlotte 117
Harris, Joseph Co. Inc. 125
Hart & Vick Seeds 118
Hershey, John W. 124
Holland Bulb Co. 122
Home Novelties Co. 118
Johnson Water Gardens 122
Kunderd, A. E. 119
Maule, William H. 117
McKibbin, John H. 122
Plantabbs Corporation 122
Rose Side Gardens 124
Sawyer Water Gardens 124
Schling, Max 121
Scott, O. M. 123
Shaw, W. B. 123
Shumway, R. H. 125
Sonderegger Nursery Co. 118
Storrs & Harrison Co. 120
Storrs & Harrison Co. 123
Three Springs Fisheries 118
Tricker, William 120
Vaughan's Seed Store 125
Vick's Sons, James, Inc. 124
Wayside Gardens 117
Whitesbog Blueberry Nurseries 117
Wild Flower Preservation Society . . . 128
Wilmore, W. W. 122
Wohlert, A. E. 124
Woodlawn Nurseries 122
Young's Aurora Nurseries 125

HOTELS
Bellevue-Stratford Hotel 68
Manhattan Hotel 68
Piccadilly Hotel 68
Vinoy Park Hotel 68

INSECTICIDES
Wilson, Andrew 125

KENNELS
Comrade Farm Kennels 130

MISCELLANEOUS
Armstrong, M. L. 130
Chicago Bird & Cage Co. 130
Garden of the Setting Sun 130
The Gem Shop 130
Inkograph 129
Magnesia Products 130
Plymouth Rock Squab Co. 130
Pronunciphone 131
Ransom Fur Farm 130
Rocks & Minerals 130
Tax Sales Service 128
Taylor Instrument Co. 127

PHOTOGRAPHIC
Bell & Howell Co. 66
Victor Animatograph 126

SPORTING GOODS
Chicago Roller Skate Co. 126
Northland Ski Co. 126
Old Town Canoes 126
Stemmler, L. E. 130
Vermont Natives Industries 126
Woods Mfg. Co. 127

TAXIDERMY
Jonas Brothers 128
North Western School of Taxidermy . . 128

TRAVEL
Yosemite Park & Curry Co. 68

The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

The Association directs encouragement of tree planting by the public; disseminates popular forestry news for the information of editors of the daily press; and compiles and distributes forestry news and reports on legislative progress for assistance of active foresters in the field.

The American Tree Association

CHARLES LATHROP PACK
President

ARTHUR NEWTON PACK
Secretary

PERCIVAL S. RIDSDALE
Treasurer

RICHARD W. WESTWOOD
Assistant Secretary

RUSSELL T. EDWARDS
Educational Director

TRADE EXPANSION MEANS BIG CALL ON THE FORESTS

TRADE expansion as outlined at the National Business Survey Conference in Washington means a greater call on the forests than ever before. The figures quoted say expenditures of about ten billion dollars are contemplated in the program for 1930. It will be well in the face of such a program to look to our forest resources of the future since the economic structure depends upon forest products. In *Forests and Mankind* just published by the Macmillan Co. the foreword says tomorrow man enters an age of man-made forests and the tale of how this came to be and how he is responding to these new conditions is one of the most colorful pages of man's development. The co-authors of the book, Charles Lathrop Pack and Tom Gill, have given the subject careful thought. Mr. Pack is widely known because of his educational work for forestry.

The story of our forests is the story of man's loyal ally in his long and perilous pilgrimage from cave dweller to master of the civilized world. Trees, from the first, have been his staunch and constant friends.

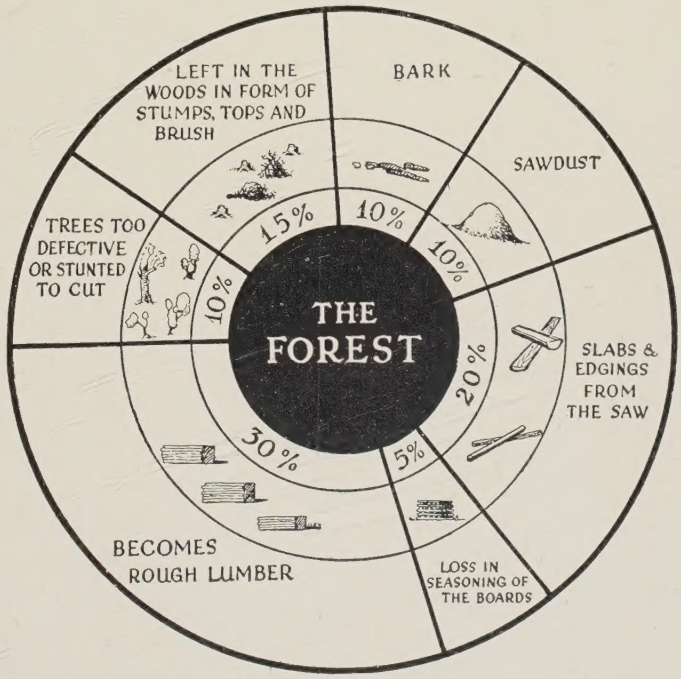
Here in America our forests present a unique background to man's conquest of the new world. Without abundant wood, without the far-reaching effects of widespread forests, the history of this country would certainly have been tremendously modified. The American pioneer could never have made this continent his own so quickly, or so easily, without the existence of those forest allies of his.

And the story of these forests, the intimate tale of what trees are, what they have done and how they have influenced human development is all part of the epic of man. It is a story that has to do with the forests of yesterday, today, and tomorrow, with the ever-changing aspects of the earth, the ceaseless, but varying relationships between men and trees, and with that very mysterious thing we call life. It is a story that began as far back as the beginning of humanity and that will not end until the end of time.

In one sense the story of our forests is a reaffirming of old Biblical wisdom, that tells us, "As ye sow, so shall ye reap." Not even from the great bountiful Mother Nature can we always take away and never replace. Some day comes a reckoning. In America we have reaped, but we have not planted. We have cut lavishly the timber heritage we found here, but we have given little thought to a new crop. Yet, just as man has emerged from an era when wild game and wild fruit were sufficient sources of his daily food, so is he emerging from an era when he can depend on the wild forests for his lumber, his paper, his turpentine, and his fuel.

Educators welcome the book just at this time. President Ernest H. Wilkins of Oberlin College says of it:—"*Forests and Mankind* will be a valuable contribution to the cause of conservation of our forests and will prove a valuable guide to those who wish to practice reforestation. The issuing of this book again puts the nation—at least all those in the country who are wise enough to sense the implications of deforestation —deeply in debt to Dr. Pack."

In the opinion of Charles W. Flint, Chancellor of Syracuse University: "it would be difficult to conceive of more vital information crowded into two hundred and fifty pages than that Mr. Charles Lathrop Pack and Tom Gill have assembled between the covers of *Forests and Mankind*, a comprehensive and humanistic treatment of the subject of Forestry. Yet it is as readable as a romance. Science and history, statistics and economics, technique and evangel and clothed in thought and language as interesting as they are instructive. The 'man on the street' or 'he who runs' not only may read, but he will. It is an important and notable contribution to our literature of Forestry."



Dr. John Grier Hibben of Princeton says. "I am sure that *Forests and Mankind* will be of value in furthering the interest in forestry in our country. Mr. Pack has been a pioneer in this region and has blazed the way into a new territory and it would be well for the citizens of our country to follow in the path which he has made clear and plain."

Going as it does into every phase of the forestry problem the book should receive the earnest study of the business world as well as of the educational. Since business depends upon forest products and since the nation now is entering the era of man-made forests, it seems the business world cannot afford to overlook the warning set forth in this book. The relationship between man and the forests is plainly set forth in a way that shows man cannot do without the forests. This fact cannot be ignored much longer by civilization.

HENDERSON'S

SPECIAL OFFER

1930 Seed Catalogue and 25-cent Rebate Slip—only 10c

Giant Waved Spencer Sweet Peas

Henderson's Invincible Asters

Brilliant Mixture Poppies

MAIL the coupon with only 10 cents, and we will mail you "Everything for the Garden," Henderson's new seed catalogue, together with the new Henderson 25-cent rebate slip, which will also entitle you, without charge, to the Henderson specialty offer of 6 packets of our tested seeds with your order.

These 6 packets are all seeds of our own introductions, and are among our most famous specialties—Ponderosa Tomato, Big Boston Lettuce, Early Scarlet Turnip Radish;—Invincible Asters, Brilliant Mixture Poppies and Giant Waved Spencer Sweet Peas. These, like all Henderson's Seeds, are tested seeds.

For 83 years, HENDERSON'S TESTED SEEDS have been the standard. Year after year, our constantly improving methods have enabled us to maintain our supremacy among American seed houses. The initial cost of your seeds is the smallest item in your garden's expense, and it is of advantage to plant seeds of recognized quality from a house of reputation and standing.

Every Rebate Slip Counts as Cash

With every catalogue will be sent our Henderson Rebate Slip which, returned to us, will be accepted as 25 cents cash payment on any order of two dollars or over.

In addition we will include with your order, without charge, the Henderson specialty collection of three packets of vegetable and three packets of flower seeds as described above.

Everything for the Garden

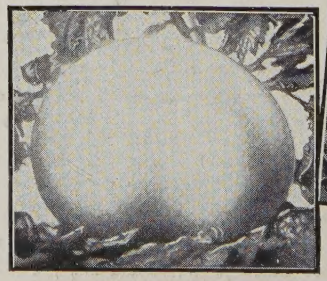
This is a book of 208 pages, with 16 beautiful color plates, 192 pages of rotogravure in various colors, and over a thousand illustrations direct from actual photographs of the results from Henderson's seeds.

It offers many special collections of vegetable seeds arranged so as to give a continuous supply of fresh vegetables throughout the Summer, and collections of flower seeds especially arranged for harmony of color and continuity of bloom.

It is a complete garden book, and should be in the hands of every lover of the garden beautiful or bountiful—Clip the coupon now!

Early Scarlet Turnip Radish

PETER HENDERSON & CO.
35 Cortlandt Street
New York City



Ponderosa Tomato

Big Boston Lettuce

PETER HENDERSON & CO.
35 CORTLANDT STREET
NEW YORK CITY

Enclosed is 10c for Henderson's 1930 advertising offer of Catalogue and 25c Rebate Slip.

Name.....

Address.....

City.....